

Alabastra Borneensia.

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Two previous papers on the Bornean flora have recently been published by me*, and the present contribution is in the nature of a continuation of these. Like the preceding papers, it consists chiefly of the description of apparently undescribed species in various genera, and the recording to Borneo for the first time of a number of previously described species of other authors. In the present communication forty-eight new species and one new genus are proposed in the families *Ulmaceae*, *Anacardiaceae*, *Elaeocarpaceae*, *Myrtaceae*, *Loganiaceae*, *Apocynaceae*, *Rubiaceae*, and *Compositae*. The larger number of additions to the Bornean flora, so far as the present paper is concerned, are found in the *Myrtaceae*, especially in the genus *Eugenia*, and in the *Elaeocarpaceae*.

ULMACEAE.

Gironniera, Gaudichaud.

***Gironniera paucinervia*, sp. nov.**

Arbor glabra partibus exceptis junioribus et stipulis et fructibus minute adpresse strigillosis; *foliis* oblongo-ovatis, in siccitate pallidis, usque ad 10 cm. longis, glabris vel subtus minutissime scaberulis, basi acutis, aequilateralibus vel subaequilateralibus, apice tenuiter subcaudato-acuminatis, margine integris vel sursum obscure crenulatis, nervis utrinque 5 vel 6 ascendentibus curvatis anastomosantibus; *infructescentiis* axillaribus, solitariis, 1 ad 2 cm. longis; *fructibus* paucis, plerumque 1 vel 2, ovoideis, compressis, circiter 8 mm. longis, acuminatis.

A tree, the younger parts, stipules, and fruits minutely appressed strigillose, otherwise glabrous. Branches terete, slender, glabrous, grayish, the very young branchlets very sparingly appressed-strigillose. Leaves oblong-ovate, coriaceous, 5 to 10 cm. long, 2 to 3.5 cm. wide, rather pale when

* Merrill, E. D. Notes on the Flora of Borneo. *Philip. Journal Science* 11 (1916) Bot. 49-100; Contributions to our Knowledge of the Flora of Borneo. *Jour. Str. Branch. Roy. As. Soc.* 76 (1917) 75-117.

dry, base acute, equilateral or nearly so, apex slenderly subcaudate-acuminate, the margins entire or slightly crenate toward the apex, the upper surface smooth, shining, the lower obscurely scaberulous; lateral nerves 5 or 6 on each side of the midrib, prominent, curved, ascending, anastomosing, the reticulations close, distinct; petioles about 5 mm. long, sparingly appressed-strigillose; stipules lanceolate, acuminate, 8 to 12 mm. long, appressed strigillose on the exposed portions. Infructescences axillary, solitary, simple, 1 to 2 cm. long, sparingly appressed-strigillose, the fruits usually one or two. Sepals ovate, somewhat acuminate, about 2 mm. long, somewhat strigillose. Fruits ovoid, somewhat compressed, very minutely strigillose, olivaceous, acuminate, about 8 mm. long, tipped by the persistent 2 to 3 mm. long style.

BRITISH NORTH BORNEO, Mount Kinabalu, Marai Parai Spur, *Mrs. Clemens 10998*, December 3, 1915.

The alliance of this species is manifestly with *Gironniera subaequalis*, Planch., from which it is distinguished by its smaller, fewer nerved, equilateral or nearly equilateral leaves, its depauperate infructescences, and its obscure, scattered, strigillose hairs, the plant, in age, being nearly glabrous.

ANACARDIACEAE.

Melanorrhoea, Wallich.

Melanorrhoea oba, sp. nov. § *Pleiocyclae*.

Arbor circiter 20 m. alta, floribus exceptis glabra; *foliis* oblongo-ellipticis ad oblongo-obovatis, coriaceis, in siccitate pallidis, nitidis, usque ad 18 cm. longis, apice breviter obtusaque acuminatis, basi cuneatis vel leviter decurrento-acuminatis, nervis utrinque 12 ad 14 distinctis; *paniculis* quam foliis longioribus, laxissime paucifloris; *floribus* longissime pedicellatis, 5-meris, sepalis calyptratim deciduis, lanceolatis, acuminatis, striatis, 6 mm. longis; *petalis* linearibus, leviter pubescentibus, 8.5 mm. longis; *staminibus* 10 in axi floris incrassato insertis, leviter pubescentibus, 2 mm. longis; filamentis leviter pubescentibus, 5 mm. longis.

A tree about 20 m. high, entirely glabrous except the flowers. Branches terete, reddish-brown. Leaves oblong-elliptic to oblong-obovate, coriaceous, 9 to 18 cm. long, 4 to 7 cm. wide, usually subequally narrowed at both ends, the apex shortly and bluntly acuminate, base cuneate or somewhat decurrent-acuminate, when dry pale, shining, and of the same color on both surfaces; lateral nerves 12 to 14 on each side of the midrib, rather prominent on the lower surface, curved, anastomosing, the reticulations distinct; petioles 1 cm.

long. Panicles terminal or in the uppermost axils, very lax, up to 25 cm. in length, the branches few, spreading, the lower ones up to 12 cm. in length, each primary branch with from 3 to 5 racemously arranged long-pedicelled flowers. Flowers 5-merous, their pedicels slender, glabrous, 1.5 to 2.5 cm. long. Calyx calyptrate, deciduous, 6 mm. long, lanceolate in outline, longitudinally striate, acuminate, glabrous. Petals 5, linear, 8 to 9 mm. long in anthesis, 0.8 mm. wide, sparingly pubescent on both surfaces. Stamens 10, inserted on the thickened, oblong-ovoid, sparingly pubescent axis of the flower; filaments pubescent, 5 mm. long. Gynophore 2 mm. long, pubescent; ovary ovoid, brown when dry, glabrous, 1 mm. long; style 1.5 mm. long.

BRITISH NORTH BORNEO, Sandakan, *Villamil 316*, February 22, 1917, on forested slopes, altitude 30 to 120 meters, the flowers white; locally known as *oba*.

Among the Bornean species this is apparently most closely allied to *Melanorrhoea macrocarpa*, Engl., but has larger, less acuminate, shorter petioled leaves and glabrous panicles. It seems, from the description, to be more closely allied to *M. curtisii*, Oliver, of the Malay Peninsula, than to any of the previously described Bornean species.

ELAEOCARPACEAE.

Elaeocarpus, Linnaeus.

This genus beautifully illustrates how little is definitely known regarding the Bornean flora. There are in our comparatively small collections of Bornean plants at least twenty-five distinct species of this characteristic genus, not all of which are in condition for determination, some specimens being with very young buds, others with fruits only. Species previously credited to Borneo are few in number and include the endemic species *Elaeocarpus beccarii*, Aug. DC., *E. gambir*, Becc., *E. octantherus*, Aug. DC., *E. longipetiolatus*, Merr., and *E. sericeus*, Stapf; as well as species previously described from extra-Bornean material, such as *E. longifolius*, Blume, *E. obtusus*, Blume (probably *E. littoralis*, T. & B.), *E. stipulis*, Blume, perhaps a misidentification of *E. gambir*, Becc., *E. acronodia*, Mast. (not *Aronodia punctata*, Blume) = *E. mastersii*, King, and *E. griffithii*, Mast. In view of the fact that further collections will unquestionably yield many additions to the list of Bornean species of *Elaeocarpus*, I have made no attempt to prepare a key to the species already known from the Island, but record below a number of species new to Borneo and describe nine as new. Five or six additional forms, none of which can be referred definitely to any described species, are represented in our collections, but before reporting them additional material will be necessary in each case.

Elaeocarpus chrysophyllus, sp. nov. § *Acronodia*.

Arbor, ramulis junioribus et subtus foliis et petiolis densissime adpresse chryseo- ad argenteo-pubescentibus, indumento nitido: *foliis* longe petiolatis, coriaceis, lanceolatis ad oblongo-lanceolatis, usque ad 10 cm. longis, tenuiter subcaudato-acuminatis, basi acutis, margine obscure adpresse apiculatis, nervis utrinque 8 vel 9, distinctis; *racemis* axillaribus, cinereo-pubescentibus, junioribus usque ad 5 cm. longis; *floribus* ♂ 4- vel raro 5-meris; *bracteolis* lanceolatis, circiter 5 mm. longis, basi biappendiculatis; *petalis* circiter 4 mm. longis (immaturis), apice breviter laciniatis, laciniis 10 ad 12, extus pubescentibus, intus glabris; *antheris* 8 vel 10.

A tree, the young branchlets petioles and lower surface of the leaves very densely and uniformly appressed-pubescent with shining golden to somewhat silvery hairs. Branches terete, glabrous, reddish-brown, about 4 mm. in diameter. Leaves coriaceous, lanceolate to oblong-lanceolate, 8 to 10 cm. long, 2.5 to 3.5 cm. wide, the apex slenderly caudate-acuminate, the acumen apiculate, base acute, margins obscurely and minutely appressed apiculate-toothed, the upper surface brownish-olivaceous, shining, glabrous except for the silvery-pubescent midrib, the lower surface uniformly and densely appressed-pubescent, the indumentum on the younger leaves golden, on the older ones silvery; lateral nerves 8 or 9 on each side of the midrib, distinct, curved, anastomosing; petioles densely silvery or golden-pubescent, 3 to 4.5 cm. long. Racemes axillary, in mature bud up to 5 cm. in length, densely cinereous-pubescent, the bracteoles pubescent, lanceolate, about 5 mm. long, each with a pair of linear, 1.5 mm. long, basal appendages or lobes, the pedicels 3 to 4 mm. long. Buds narrowly ovoid, obtuse, 4 mm. long. Sepals 4, rarely 5, externally densely cinereous-pubescent. Petals oblong-obovate, about 4 mm. long (in bud), somewhat pubescent on the back, glabrous within, the tip divided into 10 to 12, 1 mm. long, narrow lobes. Stamens 8 or 10; filaments 1 mm. long; anthers oblong, obtuse, 1.8 mm. long, one cell slightly longer than the other, not bearded. Disk-glands densely hirsute. Rudimentary ovary none.

SARAWAK, without definite locality, *Native collector 1965* (*Bur. Sci.*).

This characteristic species of the section *Acronodia* is readily distinguishable by its lanceolate, slenderly acuminate leaves which, except for the midrib, are glabrous on the upper surface and densely golden to silvery appressed-pubescent on the lower surface.

Elaeocarpus cupreus, sp. nov. § *Acronodia*.

Arbor, plus minusve pubescens; *foliis* coriaceis, elliptico-ovatis, usque ad 11 cm. longis, prominente acuminatis, basi acutis, integris vel obscurissime denticulato-crenulatis, in siccitare supra glabris subolivaceis, subtus uniformiter cupreis, ad costa nervisque puberulis, utrinque nitidis; nervis utrinque 8 ad 10, subtus prominentibus, reticulis tenuibus, subparallelis; *racemis* axillaribus, petiolo subaequalibus, pubescentibus; *floribus* ♀ 5-meris, breviter pedicellatis, 4 mm. longis; *sepalis petalisque* oblongo-lanceolatis, utrinque pubescentibus, integris, obscure acuminatis; *ovario* dense pubescente, 3-loculare.

A tree, the branchlets, petioles, midrib and lateral nerves on the lower surface of the leaves and the inflorescences minutely and densely brownish-pubescent or puberulent. Branches brown, somewhat pubescent, terete. Leaves coriaceous, elliptic-ovate, 7 to 11 cm. long, 3.5 to 5.5 cm. wide, subequally narrowed to the broadly acute base and to the rather prominently acuminate apex, the acumen usually somewhat falcate, blunt, the margins entire or minutely and obscurely denticulate-crenulate, the upper surface glabrous except the impressed midrib, pale-olivaceous, shining, the lower surface cupreous, shining, puberulent on the midrib and lateral nerves; lateral nerves prominent on the lower surface, curved, anastomosing, 8 to 10 on each side of the midrib, the reticulations very slender, subparallel; petioles brownish-puberulent, 2 to 3.5 cm. long. Racemes axillary, solitary, pubescent, about as long as the petioles, the flowers scattered below, rather densely arranged above, nodding, 5-merous, their pedicels stout, pubescent, 2 mm. long or less, each subtended by a thick, subovate, 1 mm. long bracteole. Pistillate flowers: Sepals 5, oblong-lanceolate, acuminate, 4 mm. long, 1.5 mm. wide, uniformly pubescent with short, pale-brownish, somewhat shining hairs on both surfaces. Petals similar to the sepals in all respects, of the same size, entire. Staminodes usually 8, spatulate, 1 to 1.5 mm. long, the upper thickened part minutely and obscurely pubescent. Ovary ovoid, densely pubescent, 3-celled; style about 1 mm. long. Staminate flowers not seen.

SARAWAK, without definite locality, *Native collector 1702* (*Bur. Sci.*).

This rather remarkable species is well characterized by its leaves, when dry, being pale-olivaceous on the upper surface and uniformly cupreous on the lower surface, as well as by its oblong-lanceolate, entire petals which in all respects are similar to the sepals. It is not closely allied to any previously described species known to me.

Elaeocarpus elliptifolius, sp. nov. § *Acronodia*.

Arbor circiter 5 m. alta, inflorescentiis et petiolis et ramulis junioribus subtus foliis ad costa nervisque dense rufo-

tomentosis; *foliis* coriaceis, ellipticis, usque ad 15 cm. longis, integris vel obscurissime denticulatis, breviter acuminatis, basi late acutis ad rotundatis, supra, costa excepta, glabris, olivaceis, nitidis, subtus brunneis, nervis utrinque circiter 8, prominentibus; *racemis* ex axillis defoliatis, circiter 2 cm. longis; *floribus* 4-meris; *sepalis* lanceolatis, 4 mm. longis, acuminatis, extus ferrugineo-tomentosis, intus parcissime pubescentibus; *petalis* oblongis, apice obscurissime 4-dentatis, extus dense adpresse ferrugineo-pubescentibus, intus leviter pubescentibus; *staminibus* 10; *fructibus* ellipsoideis, olivaceis 1 cm. longis, laevibus, junioribus leviter pubescentibus, vetustioribus glabrescentibus.

A tree about 5 m. high, the younger parts and the midrib and nerves on the lower surface of the leaves densely rufous-tomentose. Branches terete, dark-brownish, nearly glabrous. Leaves elliptic, coriaceous, 10 to 15 cm. long, 5 to 7.5 cm. wide, shortly and usually obtusely acuminate, base broadly acute to rounded, margins entire or above minutely and obscurely denticulate, the upper surface glabrous, except the midrib, olivaceous, shining, the lower surface brownish when dry; lateral nerves 8 on each side of the midrib, prominent, somewhat curved, anastomosing, the reticulations distinct, subparallel, rather lax; petioles 3 to 5 cm. long, thickened at the apex, densely rufous-tomentose, in age glabrous or nearly so. Racemes from the axils of fallen leaves, solitary, few flowered, about 2 cm. long, rufous-tomentose. Flowers 4-merous, their pedicels 2 to 3 mm. long. Sepals lanceolate, acuminate, 4 mm. long, 1.5 mm. wide, outside ferruginous or rufous-tomentose, inside with scattered hairs. Petals nearly as long as the sepals, oblong, outside densely appressed-tomentose, inside with scattered hairs, the apex minutely and obscurely 4-toothed. Stamens 10; filaments 1 mm. long or less; anthers oblong, subacute at both ends, scabrid, 1.5 to 1.8 mm. long, one cell slightly exceeding the other, not bearded. Rudimentary ovary densely tomentose. Disk-glands densely tomentose. Fruit ellipsoid, olivaceous when dry, 1 cm. long, more or less pubescent, becoming glabrous or nearly so, smooth, shining, 1-celled, 1-seeded, the endocarp rather hard, rugose, externally somewhat fibrillose.

BRITISH NORTH BORNEO, Mount Kinabalu, Gurulau Spur, Mrs. Clemens 10783, in forests near the summit.

This species is manifestly very closely allied to *Elaeocarpus jackianus*, Wall., which it closely resembles in most particulars, but from which it is distinguished by its much shorter racemes, densely pubescent ovaries, and more or less pubescent, somewhat smaller fruits.

Elaeocarpus clementis, sp. nov. § *Dicera*.

Arbor parva, foliis subtus ad costam et petiolis et ramulis et inflorescentiis plus minusve ferrugineo-pubescentibus; *foliis* subcoriaceis, oblongo-ovatis ad oblongo-ellipticis, longe petiolatis, usque ad 20 cm. longis, in siccitate brunneis vel subolivaceis, apice acuminatis, basi acutis, subtus minutissime et obscure glandulosis, nervis utrinque circiter 13 valde prominentibus curvatis anastomosantibus, reticulis tenuibus subparallelis; *racemis* axillaribus, petiolis aequalibus vel longioribus; *floribus* 5-meris, circiter 6 mm. longis, sepalis petalisque utrinque dense pubescentibus; *petalis* oblongis, utrinque angustatis, integris vel minutissime et obscure 2- vel 3-denticulatis; *staminibus* circiter 40; *ovario* pubescente, 3-loculare.

A small tree, the younger branchlets and inflorescences densely ferruginous-pubescent, the petioles and midribs on the lower surface of the leaves also pubescent. Branches terete, reddish-brown, glabrous. Leaves subcoriaceous, brownish to subolivaceous when dry, shining, of about the same color on both surfaces or somewhat paler beneath, oblong-ovate to oblong-elliptic, 11 to 20 cm. long, 4 to 9 cm. wide, the base rather broadly acute, not rounded, apex prominently acuminate, the acumen often slender, the margins crenate-apiculate, the lower surface minutely and obscurely glandular, glabrous except the midrib; lateral nerves about 13 on each side of the midrib, very prominent, curved, ascending, anastomosing, the reticulations slender, subparallel; petioles 4 to 10 cm. long. Racemes axillary and in the axils of fallen leaves, solitary, equaling or somewhat longer than the petioles, rather densely pubescent, many flowered. Flowers yellowish, 5-merous, their pedicels 7 to 9 mm. long, the buds ovoid. Sepals oblong, acuminate, about 5 mm. long, 1.5 to 2.3 mm. wide, uniformly and densely pubescent on both surfaces. Petals oblong, narrowed at both ends, about 6 mm. long, 2.5 mm. wide, both surfaces densely pubescent, the hairs on the inner surface reflexed, the apex acute, entire or very obscurely 2- or 3-toothed. Stamens about 40; filaments about 1 mm. long; anthers oblong-obovoid, rounded, scabrid, 1 to 1.2 mm. long, the tip not bearded. Ovary densely pubescent, ovoid, 3-celled; style glabrous, about 1 mm. long. Fruit ellipsoid, 1 to 1.5 cm. long, glabrous, smooth, grayish or brownish when dry, the endocarp hard, rather smooth.

SARAWAK, Baram District, Lio-matu, *Native collector 2766* (*Bur. Sci.*) (type); without locality, *Native collector 733* (*Bur. Sci.*): BRITISH NORTH BORNEO, Mount Kalawat, *Mrs. Clemens 11165*, along trails, margin of forests.

The alliance of this species is manifestly with the Sumatran *Elaeocarpus integripetalus*, Miq., which was rather

imperfectly described by Miquel. *Elaeocarpus integripetalus*, Miq. has somewhat fewer nerved leaves which are rounded at the base, racemes much shorter than the petioles, and 4-merous flowers.

***Elaeocarpus nigropunctatus*, sp. nov. § *Dicera*.**

Arbor, ramulis et foliis utrinque ad costam et petiolis et inflorescentiis dense pubescens; *foliis* oblongo-ovatis, crasse coriaceis, usque ad 6 cm. longis, in siccitate brunneis, subtus pallidioribus et perspicue nigro-punctatis, acuminatis, basi acutis ad subrotundatis, nervis utrinque 4 curvato-adscedentibus valde prominentibus; *racemis* axillaribus, 2 ad 3 cm. longis, paucifloris; *floribus* 5-meris, circiter 4 mm. longis; *petalis* obovatis, glabris, in $\frac{1}{3}$ superiore parte fimbriatis, laciniis 16 ad 20; *staminibus* circiter 15; *ovario* parce pubescente, 4-loculare.

A tree, the branchlets, petioles, inflorescence, and the costa on both surfaces of the leaves densely subappressed palefulvous pubescent. Branches terete, glabrous, grayish brown. Leaves oblong-ovate, thickly coriaceous, brown when dry, 4 to 6 cm. long, 1.5 to 2 cm. wide, the upper surface smooth, shining, the lower paler, dull, prominently glandular with scattered, black or dark-colored glands distinctly visible to the naked eye, base acute to somewhat rounded, apex acuminate, margin slightly crenate; lateral nerves 4 on each side of the midrib, very prominent on the lower surface, curved-ascending, anastomosing, the reticulations lax, distinct; petioles 1 to 1.5 cm. long; stipules none or minute and caducous. Racemes axillary, solitary, few-flowered, 2 to 3 cm. long, the flowers 5-merous, their pedicels densely pubescent, 5 to 6 mm. long, usually curved, each subtended by an oblong, densely pubescent, 2 mm. long, obtuse bracteole that is minutely mucronate-toothed along the margins, with often one or two reduced bracteoles above. Sepals oblong-lanceolate, acute, externally densely pubescent, 3 to 3.5 mm. long, slightly pubescent inside. Petals obovate, 4 mm. long, entirely glabrous except for the very few hairs on the median portion near the base inside, narrowed below to the cuneate base, the upper one-third cut into from 16 to 20 slender fimbriae. Stamens about 15; filaments 1 mm. long; anthers glabrous or nearly so, oblong, 1.2 mm. long, the cells equal, obtuse. Torus about 2 mm. in diameter, of five, conspicuous, bilobed, densely pubescent glands. Ovary ovoid, sparingly pubescent, 4-celled; style 2 mm. long, glabrous.

SARAWAK, Matang Road, *Native collector* 734 (*Bur. Sci.*), August 11, 1911.

A most characteristic species readily distinguishable by its small, thickly coriaceous, few-nerved leaves which are

prominently glandular beneath, the minute black glands being distinctly visible to the naked eye. Its alliance is apparently with *Elaeocarpus urayi*, King, of the Malay Peninsula.

***Elaeocarpus hosei*, sp. nov. § *Dicera*.**

Arbor, ramulis junioribus et inflorescentiis exceptis glabra; *foliis* oblongo-ellipticis, usque ad 17 cm. longis, nitidis, utrinque concoloribus, in siccitate brunneis, basi acutis, apice perspicue acuminatis, margine distincte crenatis vel denticulato-crenatis, nervis utrinque 7 vel 8 prominentibus; *racemis* ex axillis defoliatis, 15 ad 17 cm. longis, adpresse pubescentibus; *floribus* 5-meris, circiter 12 mm. diametro; *sepalis* lanceolatis, acuminatis, extus parcissime pubescentibus; *petalis* obovato-cuneatis, usque ad $\frac{2}{3}$ in laciniis numerosis (circiter 30) filiformibus divisis, laciniis in phalangibus 5 dichotomis dispositis; *antheris* obtusis, valvulis aequalibus; *ovario* parcissime pubescente vel subglabro, 3-loculare.

A tree, glabrous except the youngest branchlets and the inflorescences. Branches terete, smooth, grayish, not or very obscurely lenticellate. Leaves subcoriaceous, oblong-elliptic, 13 to 17 cm. long, 5.5 to 7.5 cm. wide, of about the same color on both surfaces, brown and shining when dry, the midrib on very young leaves slightly pubescent, otherwise glabrous, the base acute, apex rather prominently acuminate, margins distinctly crenate, often denticulate-glandular; lateral nerves 7 or 8 on each side of the midrib, prominent, anastomosing, the reticulations lax; petioles 2.5 to 5 cm. long. Racemes numerous, spreading, from the axils of the fallen leaves, 15 to 17 cm. long, appressed-pubescent with somewhat brownish hairs. Flowers numerous, 5-merous, 10 to 12 mm. in diameter, their pedicels about 1 cm. long. Sepals brown when dry, lanceolate, acuminate, about 6 mm. long, 2 mm. wide, externally obscurely pubescent, margins puberulent, inside keeled and slightly pubescent at the base. Petals obovate-cuneate, about 6 mm. long and 5 mm. wide, narrowed to the cuneate base, the upper two-thirds cut into about 30, very slender laciniae, these in turn arranged in five dichotomous phalanges, margins of the lower part obscurely pubescent and the base outside with a few hairs, otherwise glabrous. Stamens about 35; filaments scabrid, 1.5 mm. long, curved, anthers oblong, scabrid, 2 mm. long, the cells obtuse, equal, not bearded at the tips. Disk glands densely pubescent, contiguous, obscurely bilobed, forming a prominent torus 3 mm. in diameter. Ovary ovoid, very sparingly pubescent below, glabrous above, 3-celled; style glabrous, 2 mm. long.

SARAWAK, Baram District, Baram, *Hose 25* (type), 273, the former collected in January, 1895.

The alliance of this species is manifestly with *Elaeocarpus glaber*, Blume, of Java, of which a complete description has apparently never been published. My conception of the species is based largely on the figure given by Koorders, (*Atlas Baum-art. Java, fig. 427*), which was in part drawn from Blume's type material. The Bornean form differs in its larger, more numerous nerved, more prominently acuminate leaves, longer petioles, apparently slightly larger flowers, differently shaped petals, and but very slightly pubescent ovary.

***Elaeocarpus dolichobotrys*, sp. nov. § *Dicera*.**

Arbor, novellis inflorescentiisque exceptis glabra; foliis oblongis ad oblongo-ovatis, subcoriaceis, olivaceis, nitidis, usque ad 27 cm. longis et 13 cm. latis, apice obtusis, basi rotundatis, margine perspicue crenatis, crenulis in sinibus apiculato-glandulosis, nervis utrinque circiter 16; racemis ex axillis defoliatis, solitariis, leviter pubescentibus, usque ad 40 cm. longis, multifloris; floribus circiter 1.5 cm. diametro, 5-meris; sepalis margine excepto glabris, 7 mm. longis; petalis obovato-cuneiformibus, circiter 8 mm. longis, infra obscure pubescentibus, multifimbriatis; staminibus circiter 40, antheris obtusis, valvis aequilongis; ovario pubescente, 3-loculare.

A tree, the growing tip of the branchlets and the inflorescence more or less pubescent, otherwise glabrous. Branches terete, grayish-brown, the branchlets smooth, reddish-brown, glabrous except the very tip. Leaves alternate, large, oblong to oblong-ovate, subcoriaceous, olivaceous and shining when dry, of the same color on both surfaces, up to 27 cm. long and 13 cm. wide, base broadly rounded, narrowed in the uppermost part to the obtuse apex, the margins prominently crenate, the sinuses apiculate-glandular; lateral nerves about 16 on each side of the midrib, prominent, anastomosing, the reticulations lax; petioles 5 to 8 cm. long. Racemes solitary, from the axils of fallen leaves, 30 to 40 cm. long, sparingly pubescent. Flowers numerous, cream-colored, 5-merous, about 1.5 cm. in diameter, perfect, their pedicels slightly pubescent 5 to 8 mm. long. Buds ovoid, slightly pubescent. Sepals in anthesis oblong-lanceolate, acuminate, 7 mm. long, 2.5 to 3 mm. wide, glabrous, prominently keeled within, their margins puberulent. Petals obovate-cuneate, about 6 mm. long, 6 to 7 mm. wide above, minutely and obscurely pubescent in the lower 2 mm. inside and on the margins in the lower 4 mm. otherwise glabrous, the upper two-thirds cut into about 40 very slender fimbriae, these arranged in about 9 phalanges. Stamens about 40; filaments curved, about 2 mm. long; anthers oblong, scabrid, 2.5 mm. long, the valves equal, obtuse, with no terminal tuft of hairs. Disk-glands prominent, densely pubescent, more or less reniform, about 2.5 mm. wide. Ovary ovoid, pubescent, 3-celled; style 2 mm. long, glabrous.

BRITISH NORTH BORNEO, Mount Kinabalu, Kiau, *Clemens* 10048, November, 1915.

This species is well characterized by its large leaves and its greatly elongated racemes. It is undoubtedly allied to *Elaeocarpus robustus*, Roxb., from which it is distinguished by its larger, more numerous nerved leaves, much longer racemes, and larger flowers.

***Elaeocarpus castaneus*, sp. nov. § *Ganitrus*.**

Arbor, ramulis junioribus et subtus foliis ad costam nervosque et petiolis et inflorescentiis uniformiter cinereo-pubescentibus; *foliis* in siccitate castaneis, nitidis, oblongis, subcoriaceis, usque ad 15 cm. longis, nitidis, perspicue obtuse acuminatis, basi subacutis ad subrotundatis, margine distanter obscure crenulatis vel subintegris, nervis utrinque 7 vel 8, prominentibus; *racemis* numerosis, ex ramulis defoliatis, usque ad 16 cm. longis, multifloris, 5-meris; sepalis lanceolatis, acuminatis, 5 mm. longis, utrinque pubescentibus; petalis obovato-cuneatis, leviter pubescentibus, in dimidio superiore laciniatis, laciniis circiter 25; *staminibus* 25 ad 30, antheris oblongis obtusis; *ovario* dense pubescente, 5-loculare.

A tree, the branchlets, midrib and nerves on the lower surface of the leaves, petioles and inflorescences uniformly subappressed, cinereous-pubescent. Branches terete, glabrous, reddish-brown, somewhat glaucous. Leaves oblong, castaneous when dry, shining, the lower surface slightly paler than the upper, 9 to 15 cm. long, 4 to 6 cm. wide, rather prominently acuminate, the acumen blunt, usually minutely apiculate, base subacute to somewhat rounded, margins entire or with very few, minute, widely scattered crenulations, the upper surface glabrous except the sparingly pubescent midrib, the lower surface pubescent on the midrib and lateral nerves; petioles 2 to 2.5 cm. long, pubescent; lateral nerves 7 or 8 on each side of the midrib, prominent, curved, anastomosing, the primary reticulations slender, subparallel. Racemes from the ultimate branches below the leaves, numerous, spreading, uniformly cinereous-pubescent, 14 to 16 cm. long, many-flowered. Flowers 5-merous, their pedicels pubescent, 6 to 7 mm. long. Sepals lanceolate, acuminate, 5 mm. long, 1.8 mm. wide, pubescent on both surfaces, slightly keeled inside, the margins densely cinereous-pubescent. Petals obovate-cuneate, about 6 mm. long, the upper one-half cut into about 25 slender laciniae, these arranged in about 6 phalanges, very sparingly pubescent on both surfaces toward the base and on the margins, base cuneate. Stamens 25 to 30; filaments about 1 mm. long; anthers oblong, obtuse, 1.2 to 1.5 mm. long, the longer cell tipped with 2 or 3 short hairs. Torus about 2.5 mm. in

diameter, of five, prominent, densely pubescent, somewhat 2-lobed glands. Ovary ovoid, densely pubescent, 5-celled; style 3 mm. long, somewhat pubescent in the lower one-half.

SARAWAK, Baram District, Baram, *Hose 699* (type), 110, April, 1895 and October, 1894.

From the 5-celled ovary this species probably belongs to the section *Ganitus*, but it may be a species of the section *Dicera*, some of which have 5-celled ovaries. It somewhat resembles *Elaeocarpus stipularis*, Blume, but is distinguished by its fewer-nerved leaves which are glabrous except the midrib and nerves; there are no stipules on the specimens examined. From *Elaeocarpus ganitus*, Roxb. it is distinguished by its fewer-nerved leaves, its anthers on distinct filaments, and other characters.

***Elaeocarpus winkleri*, sp. nov. § *Monocera*.**

Arbor, inflorescentiis leviter pubescentibus exceptis glabra; *foliis* subcoriaceis, in siccitate pallidis, nitidis, oblongo-ovatis, usque ad 8 cm. longis, basi acutis vel subacutis, apice tenuiter acuminatis, margine obscurissime leviter glanduloso-denticulatis, nervis utrinque 7, subtus prominentibus, curvatis, anastomosantibus, reticulis densis, subfoveolatis; *racemis* axillaribus, solitariis, usque ad 6 cm. longis, leviter adpresse cinereo-pubescentibus, partibus vetustioribus glabris; *floribus* 5-meris, 6 ad 7 mm. longis; *sepalis* in siccitate nigris, lanceolatis, acuminatis, utrinque leviter pubescentibus; *petalis* oblongis vel obscure oblongo-obovatis, extus parcissime pubescentibus, intus ad carinam prominente densissime villosis, basi late rotundatis, cucullatis, margine plus minusve inflexis, apice usque ad tertiam partem fimbriatis, fimbriae 10 ad 13; *staminibus* circiter 25; *ovario* pubescente, 3-loculare.

A tree, entirely glabrous except the sparingly cinereous-pubescent inflorescence and the buds at the tips of the branchlets. Branches terete, brownish, the younger parts dark reddish-brown. Leaves numerous, oblong-ovate, subcoriaceous, pale and shining when dry, 5 to 8 cm. long, 2 to 3.5 cm. wide, apex slenderly and prominently acuminate, base acute, subacute, or sometimes slightly rounded, margins obscurely and distantly glandular-denticulate, the apiculate tips of the teeth black, appressed, the upper surface smooth, the lower subfoveolate by the close ultimate reticulations; lateral nerves 7 on each side of the midrib, prominent on the lower surface, curved, anastomosing; petioles 1.5 to 2.5 cm. long. Racemes axillary, solitary, 5 to 6 cm. long, rather few flowered, sparingly appressed cinereous-pubescent, the older parts glabrous or nearly so. Flowers 5-merous, 6 to 7 mm. long, their pedicels about 5 mm. long. Sepals black when dry, lanceolate, acu-

minate, 6 mm. long, 1.5 mm. wide, sparingly pubescent on both surfaces, the margins densely cinereous-puberulent. Petals 6 to 7 mm. long, oblong to somewhat oblong-obovate, base scarcely narrowed, broadly rounded, cucullate, margins somewhat inflexed, apical one-third cut into 10 to 13 slender fimbriae, the margins pubescent, the back sparingly pubescent in the median portion, inside densely villous on the very prominent keel. Stamens about 25; filaments 1.5 mm. long, glabrous, narrowed upward; anthers oblong, including the slender 1.2 mm. curved-awn of the outer cell 3 mm. in length, scabrid. Disk-glands 5, densely pubescent, cleft, 0.8 mm. in diameter. Ovary ovoid, pubescent, 3-celled; style 5 mm. long, pubescent.

SOUTH-EAST BORNEO, *Winkler 3303*, August, 22, 1908, "Heidewald vor Djihi." A sterile specimen from Sarawak, *Sarawak Museum 94*, 1913, apparently represents the same species.

Elaeocarpus griffithii, (Wight) Mast. in Hook. f., *Fl. Brit. Ind.* **1** (1874) 408.

Monocera griffithii, Wight, *Ill.* **1** (1841-50) 84.

SARAWAK, without definite locality, *Native collector 1675* (*Bur. Sci.*).

The specimen has young buds, but they are sufficiently mature to present the characteristic petals and stamens of the above species; while in vegetative characters the specimen agrees perfectly with the excellent series of specimens available for comparison from the Malay Peninsula. The species has previously been credited to Borneo by Pierre.

Tenasserim and Indo-China to the Malay Peninsula, Sumatra, and Java.

Elaeocarpus littoralis, T. & B., *Cat. Hort. Bogor.* (1866) 390; Pierre, *Fl. Forest. Cochinch.*, *t. 141*; Gagnepain in Lecomte *Fl. Gén. Indo-Chine*, **1** (1910) 569.

SARAWAK, Baram District, Redan, *Hose 292*, March 11, 1894.

This species has previously been reported from Borneo by King (in *Journ. As. Soc. Beng.* **60**² (1891) 134), who, however, confused *Elaeocarpus littoralis*, T. & B., with *E. robustus*, Blume. Koorders, (*Exkursionsflora von Java* **2** (1912) 570), distinguishes *Elaeocarpus littoralis*, T. & B., from *E. obtusus*, Blume, stating that the former is not wild in Java, but is rarely cultivated in parks; the type of *Elaeocarpus obtusus*, Blume, was from Mount Salak, Java. Both *Elaeocarpus littoralis*, T. & B., and *E. obtusus*, Blume, judging from the

descriptions of the latter species, are entirely distinct from the Philippine *E. monocera*, Cav. The Bornean specimen, cited above, agrees perfectly with the descriptions of *Elaeocarpus littoralis*, T. & B., and with Indo-China specimens collected by Thorel.

Burma and Indo-China, the Malay Peninsula, Sumatra, and Java (cultivated).

Elaeocarpus pedunculatus, Wall. Cat. (1831) no. 2678 p.p., *nomen nudum*; Mast. in Hook. f., Fl. Brit. Ind. **1** (1874) 408; King in Journ. As. Soc. Beng. **60**² (1891) 132.

SARAWAK, Samatan, *Foxworthy 147*, May 20, 1908, Malay *m'padu*, Dyak *tumu puti*; Baram District, Miri River, *Hose 538*, January, 1895.

Foxworthy's specimen agrees so exactly with King's extended description that I have no hesitation in referring it to Wallich's species, although I have seen no named specimens representing it. The species is definitely reported from Penang, Malacca, Perak, and Singapore. The closely allied *Monoceras palembanicum*, Miq., of Sumatra is described as having leaves rather long acuminate.

Elaeocarpus mastersii, King in Journ. As. Soc. Beng. **60**² (1891) 140.

SARAWAK, *Native collector 1499, 1942, 2330 (Bur. Sci.)*; BRITISH NORTH BORNEO, Sandakan, *Villamil 208*, April 1, 1916.

The specimens cited above agree perfectly with King's description and with a large series of specimens representing the species from the Malay Peninsula and Singapore. This form is doubtless the basis of the Bornean reference given by Masters in Hook. f. Fl. Brit. Ind. **1** (1874) 408 under *Elaeocarpus acronodia*, Mast.

Elaeocarpus paniculatus, Wall. Cat. (1831) No. 2663, *nomen nudum*; C. Muell, Adn. Fam. Elaeocarp. (1849) 12.

Monoceras leucobotryum Miq. Fl. Ind. Bat. Suppl. (1862) 409.

SARAWAK, Lundu, *Foxworthy 38*, May 10, 1908, known to the Dyaks as *umpuldú*; Baram, *Hose 291*; near Kuching, *Native collector 126, 2153 (Bur. Sci.)*.

The Bornean material agrees closely with our fine series of specimens representing Wallich's species from the Malay Peninsula. The petals are slightly and obscurely toothed at the apex, this being true of some of the specimens from the Malay Peninsula, although King described them as entire.

Malay Peninsula and Banka, not previously recorded from Borneo.

Elaeocarpus polystachyus, Wall. Cat. (1831) No. 2671, *nomen nudum*, C. Muell. Adn. Fam. Elaeocarp. (1849) 12.

SARAWAK, without definite locality, *Sarawak Museum* 41, 1913.

The specimen presents very young buds, and I refer it to *Elaeocarpus polystachyus*, Wall., a species previously known from Malacca and Singapore, with some doubt. It differs from our material representing Wallich's species in its very densely tawny-tomentose branchlets petioles and midrib, on the lower surface of the leaves. It is, at least, very close to Wallich's species, although mature material may show it to be specifically distinct.

Elaeocarpus gambir, Becc. Nelle Foreste di Borneo (1902) 594.

Elaeocarpus stipularis, Mast. in Hook. f. Fl. Brit. Ind. I (1874) 404; King in Journ. As. Soc. Beng. 662 (1891) 123, non Blume.

SARAWAK, Baram District, Miri River, *Hose* 73; Baram, *Hose* 321; Lundu, *Foxworthy* 46; near Kuching, *Native collector* 121, 123, 410, 735, 1501, 2570 (Bur. Sci.).

The above specimens were all originally identified as *Elaeocarpus stipularis*, Blume, and conform to our large series of specimens, so named, from the Malay Peninsula. However, Koorders and Valetton* state that the Javan species is not the same as the one from the Malay Peninsula described by Masters, and the form figured by Koorders† is apparently distinct from that of the Malay Peninsula and Borneo. *Elaeocarpus gambir*, Becc., is very imperfectly described, but Dr. Beccari has kindly supplied me with material from the type, and also fragments of *Beccari*, 3191 and 2486, and a specimen collected by *Riedel* in Billiton, all of which apparently represent the same species.

Elaeocarpus beccarii, Aug. DC. in Bull. Herb. Boiss. II 3 (1903) 367.

The type of this is *Beccari* 540, from Sarawak, a fragment of which has kindly been sent to me by Dr. Beccari. The species is represented by the following specimens: *Native collector* 124, 125, 1500, 1960 (Bur. Sci.), *Sarawak Museum* 97, with the native name *sanga dudok*, and a specimen collected May 11, 1893, from Kuching, collector not indicated.

* Bijdr. Boomsort. Java I (1894) 251.

† Atlas Baumarten Java 3 (1914) fig. 425.

PASSIFLORACEAE.

Passiflora, Linnaeus.***Passiflora laurifolia***, Linn. Sp. Pl. (1753) 956.

BRITISH NORTH BORNEO, Sandakan, *Villamil 245 bis*, January, 1917, cultivated and wild; Jesselton, *Mrs. Clemens 9696*, December 15, 1915 "cultivated?"

This American species has long been cultivated in the Malayan region; it is apparently spontaneous in British North Borneo.

Passiflora foetida, Linn. Sp. Pl. (1753) 959.

BRITISH NORTH BORNEO, Jesselton, *Mrs. Clemens 9616*; Sarawak, Baram, *Hose 89, Foxworthy 481*.

This American species is apparently thoroughly established in parts of Borneo as it is in the Indo-Malayan region generally.

LECYTHIDACEAE.

Barringtonia, Forster.***Barringtonia curranii***, Merr. in Philip. Journ. Sci. 1 (1906) Suppl. 211.

BRITISH NORTH BORNEO, Kiau, *Mrs. Clemens 10139, 10213, s. n.*, November, 1915.

A species previously known only from Palawan.

Barringtonia conoidea, Griff. Not. 4 (1854) 656.

Barringtonia alata Wall. Cat. (1831) no. 3633, *nomen nudum*.

Butonica alata Miens in Trans. Linn. Soc. Bot. 1 (1875) 70, t. 14, f. 10-15.

SARAWAK, Lundu, *Foxworthy 6*, May, 1908, in shallow water along a tidal stream, Malay *manga putat*; Dyak *putat laut*.

Burma, Malacca, Perak.

Barringtonia dolichobotrys, sp. nov. § *Butonica*.

Arbor glabra, circiter 15 m. alta, ramulis teretibus, rugosis, circiter 1 cm. diametro; *foliis* confertis, coriaceis, oblongo-ob lanceolatis, utrinque nitidis, usque ad 30 cm. longis, acutis ad subrotundatis, longe petiolatis, basi angustatis, cuneatis, margine leviter revolutis, integris, nervis utrinque circiter 12 supra impressis, subtus valde prominentibus; *spicis* usque ad 1 m. longis, pendulis, rhachibus circiter 1 cm. diametro; *floribus* sessilibus, circiter 6.5 cm. diametro; *calycibus* circiter 3 cm. longis, teretibus, lobis 4 vel 5, haud imbricatis, lanceolatis ad ovatis, subacutis, subcoriaceis, circiter 1.5 cm. longis; *petalis* 4, oblongo-obovatis, 4 cm. longis, subcoriaceis, recurvatis, obtusis.

A glabrous tree about 15 m. high, the ultimate branchlets about 1 cm. in diameter, brownish, prominently rugose. Leaves crowded at the apices of the branchlets, coriaceous, in general oblong-ob lanceolate, pale when dry, prominently shining on both surfaces, 20 to 30 cm. long, 6 to 11 cm. wide, apex acute to somewhat rounded, narrowed below to the cuneate base, margins somewhat revolute, entire; lateral nerves about 12 on each side of the midrib, impressed on the upper surface, very prominent on the lower surface, curved, anastomosing, the reticulations lax; petioles 4 to 5 cm. long, pale and striate except the very much thickened and prominently rugose dark-brown base. Spikes pendulous, up to 1 m. in length, the rachis nearly 1 cm. in diameter, when dry, pale, shining, prominently wrinkled. Flowers sessile, 6 to 7 cm. in diameter. Calyx about 3 cm. long, the tube terete, dark-brown when dry, 1 cm. in diameter, about 1.5 cm. long, widened upward, the lobes 4 or 5, lanceolate to ovate, coriaceous, somewhat spreading, acute to somewhat acuminate, as long as the tube, 1 to 1.7 cm. wide, not at all imbricate, apparently irregularly splitting from the closed bud. Petals 4, subcoriaceous, oblong-obovate, 4 cm. long, 2 cm. wide, recurved, obtuse. Stamens very numerous, united for the lower 5 mm., the free parts of the filaments about 4 cm. long, yellowish-white. Ovary 4-celled; ovules 3 to 6 in each cell. The disk-like annulus at the apex of the ovary inside the stamens is about 2 mm. high and 7 mm. in diameter. Style slender, about 4 cm. long. Fruits unknown.

BRITISH NORTH BORNEO, Sandakan, *Villamil 278*, December 5, 1916, in open places, altitude 90 meters. The trunk is 10 cm. in diameter and the calyx, when fresh, is brownish-red.

To this species I am disposed to refer a specimen from Sarawak, Kuching, May 22, 1893, collector not indicated. In this specimen, which is very imperfect, the leaves are rounded at the apex and up to 13 cm. in length. I have placed the species in the section *Butonica* as even in flowers with the petals not at all expanded the calyx-lobes are not at all imbricate, and the lobes all present more or less torn margins, indicating that the calyx in bud was entirely closed, in anthesis irregularly splitting into 4 or 5 lobes. From *Barringtonia macrostachya*, Kurz., of the section *Stravadium*, it is at once distinguished by its much larger buds and flowers.

***Barringtonia dolichophylla*, sp. nov.**

Arbor glabra; *foliis* oblanceolatis, crasse coriaceis, usque ad 75 cm. longis, in siccitate pallidis, utrinque nitidis, integris, basi gradatim angustatis, costa utrinque valde incrassata, nervis utrinque circiter 40, prominentibus; *spicis* ut videtur elongatis; *floribus* 4-meris, circiter 7 cm. diametro; *calycis* 3.5 cm. longis,

lobis 4, oblongo-ovatis, acutis, coriaceis, tubo subaequalibus; *petalis* 4, oblongis ad oblongo-lanceolatis, 4.5 cm. longis, obtusis; *ovario* 4-loculare.

A glabrous tree. Leaves oblanceolate, thickly coriaceous, pale and shining on both surfaces when dry, up to 75 cm. long and 10 cm. wide, entire, gradually narrowed in the lower one-half or two-thirds, the lamina narrowly decurrent nearly to the base of the petiole, the midrib very much thickened and prominent on both surfaces, on the lower surface toward the base 8 mm. thick; lateral nerves about 40 on each side of the midrib, very prominent, curved, anastomosing, the reticulations more distinct on the upper than on the lower surface; petioles 1 cm. thick, dark-brown, rugose, the wingless portion but 2 cm. long. Spikes apparently elongated and many-flowered. Flowers 4-merous, sessile, about 7 cm. in diameter. Calyx 3.5 cm. long, terete, somewhat urceolate, the tube 2 cm. long and 8 mm. thick, the lobes 4, coriaceous, oblong-ovate, acute, 1.4 to 1.7 cm. long, about 1.1 cm. wide, not imbricate. Petals 4, oblong to oblong-lanceolate, 4.5 to 5 cm. long, 1.5 to 1.7 cm. wide, rather thin, obtuse. Stamens very numerous, their filaments united for the lower 5 mm., the free parts about 4 cm. in length. Ovary 4-celled. Style 5 cm. long.

SARAWAK, Baram District, Miri, *Hose* 610, April 20, 1895.

A most characteristic species manifestly belonging in the same group with *B. dolichobotrys*. It is well characterized among all hitherto described species of *Barringtonia* by its greatly elongated, thickly coriaceous, entire, many-nerved leaves which taper gradually to the base. My specimen does not present the apical portion of the leaves, and only a fragment of the spike. The axis of the spike is pale, much wrinkled, and about 5 mm. in diameter.

MYRTACEAE.

Eugenia, Linnaeus.

This genus is enormously developed in Borneo, as in other parts of the Malayan region, and apparently here, as in other parts of the tropical Orient, a very high percentage of the species are of local occurrence. Up to the present time about forty species of the genus have been described from Bornean material, chiefly by Korthals, Blume, and Miquel, but some of the species proposed by Korthals are scarcely intelligible without an examination of his types, and some of his types are apparently no longer extant, judging by the fact that Miquel was unable to determine the status of several of the species. In our own collections of Bornean material about 60 distinct species are represented, but some of the specimens are not

in condition for identification. With nearly 100 distinct species in the Malay Peninsula, over 70 in Java, and more than 175 in the Philippines, it is not at all surprising that so many should be found in Borneo. It is confidently expected that when the flora of Borneo shall have been more thoroughly studied, the list of Bornean species of *Eugenia* will be found well to exceed 100 distinct forms. In the present paper I have described as new those forms that appear to me to represent species previously undescribed, and have credited a number of species already described by other authors from extra-Bornean material to the Island.

In the present study of this Bornean material, as in my past studies of Philippine representatives of the genus, I have placed all under *Eugenia*, *sensu latiore*, as it is absolutely impossible to distinguish definitely between *Eugenia*, *Jambosa*, and *Syzygium*, as genera, on account of the very large number of intermediate forms. Occasionally species are found, for which no subgenus or section has ever been proposed, that differ more markedly from *Eugenia* § *Eugenia* than do *Jambosa* and *Syzygium*, yet it seems to be illogical to propose new generic names for such forms; a good example of these is *Eugenia paradoxa*, Merr., described below. Blume attempted to distribute the Malayan species of *Eugenia* into a number of genera, such as *Syzygium*, *Jambosa*, *Strongylocalyx*, *Gelpkea*, *Cleistocalyx*, *Clarimyrthus*, *Microjambosa*, etc., but his proposition has not met with the approval of other botanists. In *Eugenia* as in other polymorphous groups, such as *Loranthus*, there seems to be no middle ground. The botanist must either accept the genus in its broadest sense or, as van Tieghem has proposed for *Loranthus*, divide it into a very large number of genera that can be distinguished from one another only by a critical study of each individual species. *Eugenia* as such, is a strongly marked group, and is always easily recognizable, and it seems best to treat all the species under this name. Niedenzu's division of the group into *Eugenia*, *Jambosa*, and *Syzygium* is certainly untenable. In the present paper I have placed those species with free petals in the section *Jambosa*, no matter if the petals are calyprate, so long as they are not united and those species that have united calyprate petals in the section *Syzygium*.

***Eugenia coralina*, sp. nov. § *Jambosa*.**

Arbor glabra, ramis ramulisque teretibus; *foliis* oppositis, coriaceis, ellipticis, usque ad 12 cm. longis, in siccitate pallidis vel pallide viridibus, nitidis, perspicue obtuseque acuminatis, basi acutis vel decurrento-acuminatis, supra impresso-punctatis, subtus glandulosis; nervis primariis utrinque circiter 20, tenuibus, patulis, rectis, haud prominentibus, quam secundariis vix magis distinctioribus; *inflorescentiis* terminalibus, corymbosis, circiter 5 cm. longis, e basi ramosis, ramis plerisque trichotomis cum axin ramulosque rugosis more corallii. brunneis; *floribus* 5-meris, obovoideis, 2.5 mm. longis, breviter

pedicellatis, ad apices ramulorum densissime confertis; *petalis* concavis, orbicularibus, exterioribus 2 mm. diametro, interioribus minoribus, liberis, calyptratim deciduis.

A glabrous tree, the branches and branchlets terete, the former dark-brown, somewhat wrinkled, the latter brown, striate or wrinkled, the ultimate ones 2 to 3 mm. in diameter. Leaves opposite, coriaceous, elliptic, 10 to 12 cm. long, 5 to 6.5 cm. wide, the apex rather prominently obtuse-acuminate, the base acute or decurrent-acuminate, margins recurved, when dry pale or pale-greenish, somewhat shining, the upper surface distinctly pitted, the lower glandular; primary lateral nerves slender, indistinct, about 20 on each side of the midrib, spreading, straight, scarcely more prominent than are the secondary ones and the reticulations, about equally distinct on both surfaces, anastomosing with the slender marginal nerves about 2 mm. from the edge of the leaf; petioles about 5 mm. long. Inflorescence terminal, corymbose, branched from the base, the branches normally trichotomous, the axis, branches, and branchlets brown or somewhat reddish-brown, peculiarly rugose and coral-like. Flowers very numerous, densely crowded at the tips of the ultimate branches forming subcapitate glomeri 8 to 10 mm. in diameter, the buds obovoid, 2.5 mm. long, the pedicels about 1 mm. long, the bracteoles obsolete or nearly so. Calyx tube 2 mm. long, narrowed below, black when dry, terete, shining, the teeth 5, about 1 mm. wide and 0.3 mm. long, obtuse. Petals calyptrate but not connate, the outer one concave, orbicular, 2 mm. in diameter, the other four closely imbricate within it, smaller, easily separable, 1 to 1.5 mm. in diameter. Stamens numerous, inflexed in bud.

SARAWAK, *Native collector 1869 (Bur. Sci.)*.

In leaf-form and texture, but not in color, this species resembles *Eugenia capitata*, Merr., but is entirely different in its inflorescence and in its smaller flowers. It is well characterized by the rugose, brown or reddish-brown coral-like axis branches and branchlets of its inflorescence and its densely disposed flowers.

***Eugenia capitata*, sp. nov. § *Jambosa*.**

Arbor glabra, ramis ramulisque teretibus; *foliis* oppositis, ellipticis ad ovato-ellipticis, coriaceis, usque ad 11 cm. longis, perspicue obtuseque acuminatis, basi rotundatis ad subacutis, supra nitidis, castaneis, dense puncticulatis, subtus brunneis, glandulosis, nervis utrinque numerosis, densis, tenuibus, indistinctis; *inflorescentiis* terminalibus et in axillis superioribus, densissime multifloris; *floribus* omnibus sessilibus in capitulis 1.5 ad 3 cm. diametro dispositis, 5-meris; *alabastro* oblongo-obovoideo, 5 ad 6 mm. longo, *calycis* dentibus brevibus, latis, rotundatis; *petalis* 5, valde imbricatis, exterioribus majoribus, 2 ad 3 mm. diametro, haud connatis sed calyptratim deciduis.

A glabrous tree, the branches and branchlets terete, pale-brownish, smooth, or the thin bark on the branches forming flakes, the ultimate branchlets about 2.5 mm. in diameter, thickened at the nodes. Leaves opposite, elliptic to ovate-elliptic, coriaceous, 9 to 11 cm. long, 4.5 to 6 cm. wide, the apex prominently and rather abruptly acuminate, the acumen about 1 cm. long, blunt, the base rounded to somewhat acute, margins slightly recurved, the upper surface smooth, prominently shining, castaneous, minutely and rather densely impressed-punctulate, the lower surface dull, brown or reddish-brown, glandular; nerves numerous, slender, obscure, about equally prominent on both surfaces, the primary ones about 30 on each side of the midrib, spreading, scarcely more distinct than are the secondary ones and the reticulations, uniting with the equally obscure marginal nerves about 1 mm. from the edge of the leaf; petioles dark-brown, 7 to 10 mm. long. Inflorescences terminal and in the uppermost axils, the flowers very numerous, crowded in dense globose heads 1.5 to 3 cm. in diameter formed of the greatly thickened and shortened branches of the inflorescence. Buds all sessile, oblong-obovoid, 5 to 6 mm. long, each group of two, or more usually three, flowers subtended by a whorl of broadly-ovate to oblong-ovate, obtuse to acute bracts and bracteoles, these coriaceous, castaneous, 1 to 1.5 mm. long. Calyx-tube cylindric or slightly angled by compression, narrowed below, dark-brown, shining, slightly rugose, the lobes 5, 0.5 to 0.8 mm. long, about 1.5 mm. wide, rounded. Petals 5, free, orbicular, prominently imbricate, concave, the outer one 2.5 to 3 mm. in diameter, the inner four closely imbricate within the outer one but not at all connate, free, falling as a calyptra, 2 to 2.5 mm. in diameter. Filaments numerous, inflexed.

SARAWAK, Santubong, *Native collector 2309 (Bur. Sci.)*, February-June, 1914, near the seashore, the flowers white.

A species at once recognizable by its dense, globose, capitate inflorescences. In appearance it is distinctly like various species of *Syzygium* with densely arranged obscure nerves, and would certainly be placed in *Syzygium* by some authors. As the petals are not at all united I have placed it in the section *Jambosa*.

Eugenia kiauensis, sp. nov. § *Jambosa*.

Arbor glabra, ramis teretibus vel indistincte 4-angulatis, crassis, ultimis circiter 6 mm. diametro, pallide brunneis; *foliis* oppositis, sessilibus, usque ad 25 cm. longis, coriaceis, oblongo-ellipticis, apice acute acuminatis, basi leviter auriculato-cordatis, nervis utrinque circiter 20, subtus prominentibus, anastomosantibus; *inflorescentiis* terminalibus, circiter 7 cm. longis, e basi ramosis, corymbosis; *floribus* magnis, circiter 4

cm. diametro, sessilibus, plerumque in triadibus dispositis; *calycis* tubo obconico circiter 1 cm. longo, lobis 4 orbiculari-reniformibus persistentibus prominentibus.

A glabrous tree, the branches and branchlets terete or somewhat 4-angled, pale-brownish, the ultimate ones about 6 mm. in diameter. Leaves opposite, sessile, coriaceous, oblong-elliptic, 18 to 25 cm. long, 7 to 9.5 cm. wide, narrowed upward to the subacutely acuminate apex, the base rounded and somewhat auriculate-cordate, the upper surface pale-olivaceous and shining when dry, the lower paler, typically eglandular; lateral nerves about 20 on each side of the midrib, rather distant, spreading, slightly curved, anastomosing with the equally distinct, somewhat arched, marginal nerves 3 to 4 mm. from the edge of the leaf, the reticulations lax, indistinct. Inflorescences terminal, corymbose, branched from the base, about 7 cm. long, the branches rather stout, brown, rugose, 4-angled, typically trichotomous, the flowers in triads at the tips of the branchlets. Flowers sessile, white, 4-merous, about 4 cm. in diameter. Calyx-tube obconic, brown when dry, terete, about 1 cm. long and nearly as wide at the top, the lobes 4, reniform-orbicular, rounded, prominently punctate, persistent, about 6 mm. long and 9 mm. wide. Petals 4, orbicular to broadly elliptic, prominently glandular, rounded, 11 to 13 mm. long. Stamens indefinite, their filaments 2 to 2.4 cm. long. Style about 2 cm. long.

BRITISH NORTH BORNEO, Mount Kinabalu, Kiau, *Mrs. Clemens 10132*, November 8, 1915. Probably referable here is *Mrs. Clemens 11104* from the trail to the Marai Parai Spur, December 3, 1915, but in this specimen the leaves are distinctly glandular on the lower surface.

By the various keys to Malayan species of *Eugenia*, this comes in the group with *Eugenia formosa*, Wall., and *E. javanica*, Lam., but in spite of its large flowers and sessile, somewhat auriculate-cordate, rather large leaves, is not really very closely allied to these species.

***Eugenia paradoxa*, sp. nov. § *Jambosa* (*Cleistocalyx*).**

Arbor glabra, ramis griseis teretibus, ramulis junioribus brunneis teretibus vel leviter compressis; *foliis* oblongo-ellipticis, sessilibus vel brevissime petiolatis, usque ad 9 cm. longis, coriaceis, apice rotundatis, basi rotundatis vel leviter cordatis, subtus puncticulatis, nervis utrinque 10 ad 14, tenuibus, obscure anastomosantibus; *inflorescentiis* axillaribus terminalibusque, brevibus, paucifloris; *floribus* fasciculatis vel racemose dispositis, sub anthesin circiter 1.8 cm. longis; *alabastro* ovoideo circiter 1 cm. longo, deorsum angustato; *calycis* superiore parte calyptratim decidua; *petalis* 4, liberis; *staminibus* numerosissimis, filamentis 10 ad 12 mm. longis.

A glabrous tree, the branches pale-gray, terete, the youngest branchlets brown, somewhat compressed or terete, 2 mm. in diameter or less. Leaves opposite, coriaceous, oblong-elliptic, 6 to 9 cm. long, 2.5 to 3.5 cm. wide, apex rounded, base rounded or slightly cordate, sessile or nearly so, subolivaceous or brownish when dry, somewhat shining, the upper surface obscurely pitted, the lower glandular-punctate; lateral nerves 10 to 14 on each side of the midrib, slender, not prominent, obscurely anastomosing. Flowers axillary and terminal, fascicled or in short, few-flowered racemes, the inflorescences not exceeding 2 cm. in length. Buds about 1 cm. long, obovoid, narrowed below into the distinct pseudo-stalk, terete, brown, glandular, the calyx-tube at the mouth 6 to 7 mm. wide, in bud closed by the calyptra which apparently represents the calyx-lobes, the calyptra orbicular in outline, 7 mm. in diameter, radiate-reticulate, subconic, obscurely apiculate, when fallen leaving the truncate calyx-rim. Petals 4, free, orbicular to obovate, 4 to 4.5 mm. long, falling with the calyptra (top of the calyx) but not at all united with it. Stamens very numerous, their filaments 10 to 12 mm. long, the flower in full anthesis about 1.8 cm. long and wide.

SARAWAK, *Native collector 365 (Bur. Sci.)*.

This species is remarkable in its floral structure, in the calyptrate calyx resembling *Eugenia operculata*, Roxb., and the Philippine *E. clausa*, C. B. Rob., but remote from both of these in its vegetative and inflorescence characters. *Eugenia operculata*, Roxb., is placed in the section *Syzygium*, where the present species cannot belong because its petals, although falling as a calyptra inside the apex of the calyx, are entirely free. The three species, *Eugenia operculata*, *E. clausa*, and *E. paradoxo* are more distinct from *Eugenia* (§ *Eueugenia*), *Jambosa*, and *Syzygium*, which some authors maintain as distinct genera, than are these sections (or genera) from each other, yet unless the genus *Eugenia* be split up into very numerous genera distinguished from each other by very minor characters, there is no warrant for considering the species above described, and the others discussed herewith, as a distinct generic type.

***Eugenia elliptilimba*, sp. nov. § *Jambosa*.**

Species *E. grandi* similis, sed differt floribus multo minoribus circiter 6 mm. longis, et calycis tubo circiter 2.5 mm. diametro; ramis ramulisque teretibus; foliis coriaceis, ellipticis ad late oblongo-ellipticis, usque ad 18 cm. longis, apice breviter obtuseque acuminatis, basi leviter rotundatis et paullo decurrento-acuminatis, in siccitate castaneis vel atro-brunneis, nitidis, nervis primariis utrinque circiter 20 distinctis juxta marginem distincte anastomosantibus; inflorescentiis terminalibus, corymbosis, pedunculatis, circiter 10 cm. longis; floribus

5-meris, plerumque in triadibus dispositis, anguste oblongo-obovoideis; *calyce* deorsum angustato, basi cuneato, leviter longitudinaliter striato, truncato; *petalis* 5, liberis, imbricatis, concavis, exterioribus majoribus.

A glabrous tree, the branches and branchlets terete or the latter slightly compressed, brown to dark-brown, smooth. Leaves opposite or subopposite, elliptic to broadly oblong-elliptic, coriaceous, 12 to 18 cm. long, 5.5 to 8 cm. wide, apex shortly and bluntly acuminate, base somewhat rounded and slightly decurrent-acuminate, not punctate, the upper surface castaneous or dark-brown when dry, shining, the lower paler; primary lateral nerves about 20 on each side of the midrib, distinct, spreading, slightly curved, anastomosing with the equally distinct marginal nerves about 3 mm. from the edge of the leaf, and with a much less distinct additional marginal nerve closer to the edge of the leaf, the secondary nerves and reticulations rather lax, distinct on both surfaces; petioles 5 to 8 mm. long. Panicles terminal, peduncled, corymbose, about 10 cm. long including the peduncle, 6 to 8 cm. wide, the branches mostly trichotomous, the flowers mostly in triads at the apices of the branchlets. Flowers 5-merous, including the pseudostalk about 6 mm. long, dark-brown when dry. Calyx, in bud, narrowly oblong-obovoid, base cuneate, the limb truncate, about 2.5 mm. wide, longitudinally striate. Petals 5, free, strongly imbricate, orbicular, concave, the outer one 2.5 mm. in diameter, covering the somewhat smaller inner ones, all falling as a whole but not at all united. Stamens 40 to 50, their filaments about 2.5 mm. long.

SARAWAK, *Native collector 254 (Bur. Sci.)*.

In general appearance and especially in its vegetable characters this species closely resembles *Eugenia grandis*, Wight, to which it is apparently closely allied. It is distinguished by its much smaller flowers.

***Eugenia castanea*, sp. nov. § *Jambosa*.**

Arbor glabra, ramulis exceptis inflorescentiisque minute castaneo-puberulo-papillatis; *ramis* teretibus cortice lamellato facile secedente tectis, ramulis junioribus plerumque 4-angulatis; *foliis* oppositis, oblongis ad oblongo-ellipticis, castaneis vel supra atro-castaneis, nitidis, usque ad 14 cm. longis, epunctatis, perspicue abrupte obtuseque acuminatis, basi acutis, nervis primariis utrinque circiter 25, distinctis cum secundariis in nervum inframarginalem confluentibus; *inflorescentiis* plerumque terminalibus, corymbosis, circiter 7 cm. longis, pedunculatis vel e basi ramosis; *floribus* 5-meris, plerumque in triadibus dispositis; *calyce* circiter 6 mm. longo, anguste oblongo-obovoideo, deorsum valde angustato.

A tree, glabrous except the distinctly and rather densely castaneous-puberulent-papillose branchlets and inflorescences. Branches terete, reddish-brown or castaneous, slender, the bark separating in elongated flakes, the branchlets usually 4-angled, smooth, castaneous. Leaves opposite, subcoriaceous, oblong to oblong-elliptic, 6 to 14 cm. long, 3 to 6 cm. wide, castaneous and shining on both surfaces or the upper surface atro-castaneous, not punctate, the apex with a prominent obtuse acumen about 1 cm. long, base acute; primary lateral nerves about 25 on each side of the midrib, distinct as are the secondary ones and the reticulations, spreading, anastomosing with the marginal veins about 2 mm. from the edge of the leaf; petioles dark-brown or nearly black, 2 to 3 mm. long. Panicles corymbose, mostly terminal, usually about 7 cm. long, peduncled or branched from the base, uniformly and minutely puberulent-papillose, the branches mostly trichotomous, the flowers all sessile in triads on the ultimate branchlets. Flowers white, 5-merous, the calyx, including the pseudo-stalk, about 6 mm. long, glabrous or nearly so, terete, dark-brown when dry, 2 to 3 mm. wide at the throat, much narrowed below, the limb with 5 very shallow, rounded lobes, the subtending bracteoles oblong, less than 1 mm. long. Petals imbricate in a calyptra, concave, free, 3 to 4 mm. in diameter. Stamens indefinite, 6 to 8 mm. long.

SARAWAK, Baram District, Baram, *Hose 359* (type), November 18, 1894; Miri, *Hose 675* April 20, 1895; Mount Poe, *Foxworthy 223*, May 24, 1908.

I am inclined to refer here also *Native collector 815, 1170, 2178* (*Bur. Sci.*), these specimens differing from the type chiefly if not only in having the ultimate branchlets terete instead of 4-angled.

Eugenia castanea is well characterized by the flaky bark on the branches, its short-petioled, castaneous, densely nerved, eglandular leaves which are abruptly and obtusely acuminate, and its puberulent-papillose branchlets and inflorescences.

***Eugenia kuchingensis*, sp. nov. § *Jambosa*.**

Arbor glabra, ramis ramulisque teretibus; *foliis* coriaceis, in siccitate bruneis, ellipticis ad late oblongo-ellipticis, usque ad 20 cm. longis, obtuse acuminatis, basi acutis vel leviter acuminatis, eglandulosis, nervis utrinque circiter 15, tenuibus, rectis, patulis, cum venis sub margine anastomosantibus, reticulis obscuris vel saltem in pagina superiore obsoletis; *paniculis* subcorymbosis, terminalibus, usque ad 10 cm. longis; *floribus* circiter 1.5 cm. longis, in ramulis ultimis subcapitatis dispositis; *calycis* tubo turbinato 8 mm. longo, lobis inaequalibus.

A glabrous tree, the branches and branchlets terete, usual-

ly grayish. Leaves coriaceous, elliptic to broadly oblong-elliptic, 13 to 20 cm. long, 5 to 8 cm. wide, coriaceous, shining, subequally narrowed to the blunt-acuminate apex and to the acute or somewhat decurrent-acuminate base, the upper surface olivaceous to blackish-brown, the lower surface usually castaneous when dry; lateral nerves about 15 on each side of the midrib, slender, spreading, nearly straight, usually not prominent on either surface, anastomosing with the single pair of marginal nerves at 3 to 4 mm. from the edge of the leaf, the reticulations lax, indistinct, usually obsolete on the upper surface; petioles stout, rugose, usually black when dry, 1 to 1.5 cm. long. Panicles terminal, subcorymbose, 8 to 10 cm. long, branched from the base, the flowers subcapitately arranged, 3 to 6 at the tip of each ultimate branchlet, about 1.5 cm. long, sessile. Calyx turbinate, narrowed below, sometimes longitudinally striate, about 8 mm. long and 6 mm. wide, the lobes 4, unequal, reniform.

SARAWAK, Kuching and vicinity, *Native collector 258* (type), 813, 1625, 1882, 2138 (*Bur. Sci.*), Hewitt, November, 1905; Santubong, Hewitt, January, 1907; Samatan, Foxworthy 152, May, 1908.

Judging from the number of collections this species must be common in Sarawak; native names recorded are *uba jambu* and *uba nyali*. Its alliance is manifestly with *Eugenia grandis*, Wight, from which it is at once distinguished by its obscure reticulations and the entire absence of the second pair of marginal veins. The forms described by Blume as *Jambosa grandis* and *Jambosa firma* are apparently both referable to *Eugenia grandis*, Wight, but *Jambosa urceolata*, Korth., described from Bornean material, reduced by Blume as a variety of *J. grandis*, is interpreted by King as an entirely different species, *Eugenia urceolata*, (Korth.) King.

***Eugenia grandis*, Wight. Ill. 2 (1841-50) 17.**

Jambosa grandis, Blume, Mus. Bct. 1 (1849) 108.

Jambosa firma, Blume, l.c.

SARAWAK, Samatan, Foxworthy 173, back of the mangrove, May, 1908, Malay *uba*.

Burma to Penang, the Malay Peninsula, and Singapore.

***Eugenia sarawacensis*, sp. nov.**

Arbor glabra, ramis ramisque teretibus; *foliis* oppositis, coriaceis, oblongo-ovatis ad oblongo-ellipticis, usque ad 9 cm. longis, utrinque subaequaliter angustatis, basi acutis, apice obtuse acuminatis, in siccitate brunneis, nitidis, eglandulosis vel subtus obscurissime puncticulatis, basi tenuiter 5-plinerviis, paribus interioribus majoribus inter lateralibus haud arcuatis,

nervis lateralibus utrinque circiter 7 irregularibus adscendentibus distinctis; *paniculis* terminalibus, circiter 7 cm. longis, e basi ramosis, corymboso-cymosis, dichotome vel trichotome ramosis; *floribus* 4-meris, 3 ad 6 in ramulis ultimis dispositis, alabastro oblongo-obovoideo, circiter 5 mm. longo.

A glabrous tree, the branches and branchlets terete or the latter compressed at the nodes, brown or pale-brownish, smooth. Leaves opposite, coriaceous, oblong-ovate to oblong-elliptic, 7 to 9 cm. long, 3.5 to 5 cm. wide, subequally narrowed to the acute base and to the blunt acuminate apex, when dry brown, shining, the lower surface paler than the upper, eglandular or very obscurely punctulate, the base slenderly 5-plinerved, the inner pair more prominent than the outer, extending to the apex, scarcely or not at all arched between the ends of the lateral nerves, the latter usually about 7 on each side of the midrib, ascending, irregular, anastomosing, the reticulations rather lax, distinct; petioles 5 to 8 mm. long. Panicles terminal, lax, about 7 cm. long, branched from the base, corymboso-cymose, dichotomously or trichotomously branched, the flowers 4-merous, 3 to 6 at the tip of each ultimate branchlet, slightly angular, the buds oblong-obovoid, about 5 mm. long including the pseudo-stalk, brown and somewhat shining when dry. Calyx-lobes 4, broad, obscure.

SARAWAK, Matang Road, *Native collector 812, 816 (Bur. Sci.)*, July 1 and 3, 1911.

This species is apparently as closely allied to *Eugenia mülleri*, Miq., as to any other species, but differs conspicuously in its distinctly acuminate leaves.

***Eugenia litseaefolia*, sp. nov.**

Arbor glabra, ramis ramulisque teretibus; *foliis* oppositis vel suboppositis, oblongo-obovatis, coriaceis, usque ad 11 cm. longis, obtusis ad breviter obtuse acuminatis, basi acutis, subtus glaucescentibus, eglandulosis, nervis utrinque circiter 6 adscendentibus irregularibus laxe anastomosantibus; *paniculis* terminalibus, laxis, circiter 10 cm. longis; *floribus* paucis, sessilibus, in alabastro ovoideo-ellipsoideis, circiter 3 mm. longis.

A glabrous tree, the branches and branchlets terete, smooth, the former pale-brownish, the latter dark-colored, 1.5 to 2 mm. in diameter. Leaves opposite or subopposite, coriaceous, oblong-obovate, 9 to 11 cm. long, 3 to 4 cm. wide, apex obtuse to shortly blunt-acuminate, base acute, the upper surface brownish, somewhat shining, the lower distinctly glaucescent, eglandular; lateral nerves about 6 on each side of the midrib, irregular, ascending, curved, laxly anastomosing, the

reticulations very lax; petioles nearly black when dry, 1.5 to 2 cm. long. Panicles terminal, lax, about 10 cm. long, branched at or from near the base, the branches spreading, the lower ones up to 4.5 cm. long. Flowers few, all sessile, mostly in threes on the ultimate branchlets, the buds ovoid-ellipsoid, about 3 mm. long, black when dry, the calyx-limb with 4, shallow, broad, obscure lobes, young fruit ovoid, black when dry, crowned by the shallow calyx-lobes.

SARAWAK, *Native collector 260 (Bur. Sci.)*.

The alliance of this species is apparently with *Eugenia mülleri*, Miq., from which it is distinguished by its leaves usually being more or less acuminate, never retuse at the apex, by being distinctly glaucous beneath, and by its sessile flowers. In aspect the leaves strongly resemble those of some species of *Litsea*.

***Eugenia caudatilimba*, sp. nov. § *Jambosa*.**

Arbor glabra, ramis ramulisque tenuibus teretibus; *foliis* oblongo-ovatis, coriaceis, usque ad 9 cm. longis, caudato-acuminatis, basi acutis vel subrotundatis, in siccitate brunneis, supra parce impresso-punctatis, subtus glanduloso-puncticulatis, nervis utrinque circiter 15, obscuris, interdum obsolete; *inflorescentiis* axillaribus terminalibusque, brevissimis, 5- ad 7-floris, cum floribus vix 1.5 cm. longis; *floribus* 4-meris, calycis tubo obconico, 5 mm. longo.

A glabrous tree, the branches and branchlets slender, terete, brown, the latter 1 to 2 mm. in diameter. Leaves opposite, brown when dry or the upper surface somewhat olivaceous, oblong-ovate, coriaceous, prominently caudate-acuminate, the acumen slender, obtuse, up to 1.5 cm. long, base acute to somewhat rounded, margins recurved, the upper surface slightly shining, sparingly impressed-punctate, the lower surface dull, glandular-puncticulate; lateral nerves slender, obscure, about 15 on each side of the midrib, sometimes obsolete; petioles brown, rugose, about 5 mm. long. Inflorescences very short, axillary and terminal, 5- to 7-flowered, the axis but 2 or 3 mm. long, the flowers crowded, racemes, 4-merous, including the stamens about 10 mm. long, their pedicels 1 to 3 mm. long. Calyx-tube obconic, terete, brown, 5 mm. long and wide, the lobes 4, spreading, broadly obovate, rounded, punctate, 4 mm. long, usually wider than long. Petals broadly ovate, 3.5 mm. long. Stamens indefinite, their filaments 7 to 9 mm. long.

SARAWAK, without definite locality, *Native collector 1169 (Bur. Sci.)*.

The characteristic features of this species are its slender terete branchlets, its brown, coriaceous, prominently caudate-acuminate, obscurely nerved leaves which are sparingly pitted on the upper surface, and its very short, few-flowered, axillary and terminal inflorescences.

Eugenia punctilimba, sp. nov. § *Jambosa*.

Arbor glabra, ramis ramulisque teretibus; *foliis* obovato-oblongis ad oblongo-ellipticis, usque ad 7 cm. longis, obtusis vel rotundatis, basi acutis, supra distincte impresso-punctatis, subolivaceis, nitidis, utrinque concoloribus, leviter glanduloso-punctatis, nervis utrinque numerosis tenuibus densis; *inflorescentiis* terminalibus, 2 ad 3 cm. longis, pauciramosis, axi ramulisque plus minusve 4-angulatis crassis; *floribus* 5-meris, circiter 3 mm. longis, obovoideis, omnibus sessilibus, ad apices ramulorum dense confertis.

A glabrous tree, the branches and branchlets slender, terete, pale-brownish, or the very youngest branchlets obscurely 4-angled, 1.5 to 2 mm. in diameter. Leaves opposite, coriaceous, obovate-oblong to oblong-elliptic, 4 to 7 cm. long, 2 to 3.5 cm. wide, apex obtuse to rounded, base acute, margins slightly recurved, the upper surface subolivaceous, somewhat shining, distinctly pitted, the lower surface of the same color, somewhat glandular-punctate; lateral nerves slender, rather densely arranged, about 30 on each side of the midrib, straight, anastomosing with the marginal veins about 1 mm. from the edge of the leaf; petioles dark-brown, rugose, about 2 mm. long. Inflorescences terminal, 2 to 3 cm. long, usually peduncled, trichotomously branched, the axis and branches dark-brown, rather stout, usually 4-angled, the flowers sessile, densely crowded at the tips of the few branches, the inflorescences 2.5 to 3 cm. wide. Flowers apparently white, in bud obovoid, about 3 mm. long, the subtending bracteoles triangular-ovate, acute, 0.8 mm. long. Calyx-tube narrowed below, brown, somewhat shining when dry, the teeth 5, ovate, acute, 0.5 mm. long. Petals orbicular, 1.5 mm. in diameter, falling as a calyptra but easily separable. Stamens about 20, inflexed.

BRITISH NORTH BORNEO, Mount Kinabalu, Marai Parai Spur, *Mrs. Clemens 10888*, November 22, 1915 (type): SARAWAK, Mount Merinjak, *Native collector 2514 (Bur. Sci.)* Feb.-June, 1914.

This species is well characterized by its densely nerved, rather small, short petioled, obtuse to rounded leaves which are distinctly pitted on the upper surface, as well as by its short terminal inflorescences, the flowers all sessile and crowded at the tips of the branchlets.

Eugenia baramensis, sp. nov. § *Jambosa*.

Arbor glabra, ramis tenuibus teretibus, ramulis castaneis distincte 4-angulatis; *foliis* oblongo-ellipticis, subcoriaceis, usque ad 5 cm. longis, in siccitate castaneis, nitidis, prominente obtuse acuminatis, basi acutis, nervis primariis utrinque circiter 15 distinctis, nervis secundariis parallelis, reticulis subobsoletis; *inflorescentiis* axillaribus, depauperatocymosis, paucifloris, 5 ad 10 mm. longis, vel floribus fasciculatis: *floribus* circiter 7 mm. longis (filamentis inclusis), in alabastro obovoideo.

A glabrous tree the branches slender, terete, pale, 2 mm. in diameter or less, the branchlets castaneous, distinctly 4-angled, the internodes 1 to 2 cm. long. Leaves opposite, subcoriaceous, oblong-elliptic, 3 to 5 cm. long, 1.3 to 2 cm. wide, subequally narrowed to the acute base and to the rather slenderly but obtusely acuminate apex, when dry castaneous, of about the same color on both surfaces, somewhat shining; primary lateral nerves about 15 on each side of the midrib, spreading, slightly curved, slender, anastomosing with the slender marginal nerves about 1 mm. from the edge of the leaf, the secondary ones much less prominent, parallel, the reticulations indistinct or subobsolete; petioles 2 to 4 mm. long. Flowers axillary, few, in short, depauperate, few-flowered cymes 1 cm. long or less, or sometimes in 3-flowered fascicles, the bracteoles ovate, acute, about 0.5 mm. long. Buds obovoid, about 3 mm. long, dark-brown when dry, the calyx-tube narrowed below, in anthesis 3 mm. long, about 3 mm. wide at the throat, the limb with 4, shallow, rounded, obscure lobes. Petals more or less cohering, orbicular, 2 mm. in diameter. Stamens indefinite, their filaments 4 to 5 mm. long.

SARAWAK, Baram District, Entoyut River, *Hose 399*, December, 1894.

This species is well characterized by its small, blunt-acuminate leaves which are castaneous when dry, and its few axillary flowers which are fascicled or disposed in depauperate cymes 1 cm. long or less. In size and appearance the flowers closely approximate to those of *Eugenia cymosa*, Lam.; but while the present species is apparently in the same general group as Lamarck's species, it is entirely different in its vegetative and inflorescence characters.

Eugenia heteroclada, sp. nov. § *Jambosa*.

Arbor glabra, ramis laevibus pallidis teretibus, ramulis prominente 4-angulatis anguste quadrialatis, internodiis ultimis sursum distincte incrassatis; *foliis* oppositis, brevissime petiolatis, lanceolatis ad oblongo-lanceolatis, usque ad 15 cm.

longis, acuminatis, basi rotundatis et leviter cordatis, nervis lateralibus utrinque circiter 10 valde prominentibus cum intramarginalibus anastomosantibus; floribus terminalibus, solitariis vel binis, mediocribus, distincte pedicellatis, 4-meris. calycis tubo obconico, circiter 1 cm. longo.

A glabrous tree, the branches smooth, terete, pale, slender, the branchlets 4-angled, narrowly 4-winged, the ultimate internodes 4 to 7 cm. long, distinctly thickened upward, often terete below, but always 4-angled and winged above. Leaves opposite, subcoriaceous, oblong-lanceolate to lanceolate, 10 to 13 cm. long, 2 to 3.8 cm. wide, narrowed upward to the rather slenderly acuminate apex, base rounded, slightly cordate, when dry rather pale, shining; primary lateral nerves about 10 on each side of the midrib, spreading, distant, slightly curved, very prominent on the lower surface, anastomosing with the equally prominent, slightly arched, marginal nerves at from 2 to 4 mm. from the margin; petioles brown, 2 mm. long or less. Flowers white, terminal, solitary or in pairs, sometimes in a two-flowered raceme, their pedicels about 5 mm. long, each pedicel subtended by two or three pairs of ovate-lanceolate, small, decussate bracts, the flowers subtended by a pair of similar bracteoles. Calyx-tube obconic, about 1 cm. long and wide, brown when dry, smooth, the lobes 4, spreading, reniform, 5 to 7 mm. wide; style about 2.5 cm. long.

BRITISH NORTH BORNEO, Mount Kinabalu, Kiau, Mrs. Clemens 10127, November 30, 1915.

The alliance of this species is manifestly with the Philippine *Eugenia phanerophlebia*, C. B. Rob., and the Javan *E. sexangulata*, Koord. & Val., differing from the former especially in its smaller, fewer-nerved leaves, smaller flowers and obconic, not cup-shaped calyx-tube, and from the latter by its few flowers, in its vegetative characters and in its 4- (not 6-) angled branchlets, the ultimate ones being distinctly winged. A striking character of the Bornean species is the upward thickening of the ultimate internodes, these usually terete or nearly so below, 4-angled and finally 4-winged in the thickened upper part.

Eugenia multibracteolata, sp. nov. § *Jambosa* (*Leptomyrtus*, Miquel).

Arbor parva, 3 ad 4 m. alta, glabra, ramis teretibus purpureo-brunneis, ramulis pallidis prominente 4-angulatis, internodiis sursum incrassatis et distincte 4-alatis; foliis crasse coriaceis, ovatis ad oblongo-ovatis, usque ad 11 cm. longis, obtuse acuminatis, basi late rotundatis et distincte cordatis, margine revolutis, brevissime petiolatis, nervis utrinque circiter 15 patulis indistinctis; cymis axillaribus terminalibusque,

usque ad 4 cm. longis; *floribus* circiter 8.5 mm. longis ad apicem ramulorum confertis sessilibus, bracteis bracteolisque involuerantibus; calyci deorsum angustato, rugoso, glaucescente, lobis 5, rariter 4, ovatis rotundatis, 2 ad 2.5 mm. longis.

A small straggling tree 3 to 4 m. high, entirely glabrous, the branches terete, 2 to 3 mm. in diameter, purplish-brown, smooth, shining, the younger ones with the remains of the flaky or stringy cortex of the branchlets, the branchlets distinctly thicker than the ultimate branches, pale-brownish, prominently 4-angled, the internodes thickened upward and distinctly 4-winged, the wings ending at the nodes in rounded auricles. Leaves opposite, thickly coriaceous, ovate to oblong-ovate, 9 to 11 cm. long, 4 to 5.5 cm. wide, brownish or pale-brownish when dry, sometimes slightly glaucous, the lower surface paler than the upper, obscurely glandular beneath, apex blunt-acuminate, base broadly rounded and distinctly cordate, margins recurved; lateral nerves about 15 on each side of the midrib, usually obscure, faintly anastomosing; petioles stout, 3 mm. long or less, reddish-brown, rugose, distinctly undulate-winged. Inflorescences axillary and terminal, cymose up to 4 cm. in length, the axis and branches prominently 4-angled, pale-brownish, the flowers all sessile, crowded at the apices of the branchlets, 5 to 7 on each branchlet, subtended by a prominent involucre of pale-brownish bracts and bracteoles, the bracts broadly ovate, obtusely acuminate, about 6 mm. long and 4 mm. wide, the bracteoles narrowly oblong, 6 mm. long, 2 to 3 mm. wide. Flowers 8 to 9 mm. long, the calyx-tube narrowed below, rugose when dry, not at all tuberculate, above about 3 mm. in diameter, the lobes 5, broadly ovate, rounded, 2 to 2.5 mm. long, two usually distinctly shorter than the other three. Petals orbicular, 3 mm. in diameter. Filaments 6 to 7 mm. long.

SARAWAK, Mount Santubong, *Native collector 2240 (Bur. Sci.)* (type), June, 1914; *Foxworthy 443*, June 7, 1908, on the forested summit of a small peak, altitude about 300 meters, known to the Malays as *pala musu*.

A very characteristic species belonging in the group with *Eugenia zeylanica*, Wight, from which it is distinguished by its larger leaves and flowers, very prominent bracts and bracteoles, non-tuberculate calyces, and other characters. It is equally distinct from the other described forms in this small group.

Eugenia perparvifolia, sp. nov. § *Jambosa* (*Leptomyrtus*, Miquel).

Arbor parva, 3 ad 6 m. alta, glabra, ramis ramulisque tenuibus rubro-castaneis, ramis teretibus, ramulis distincte 4-angulatis; *foliis* ovatis ad ovato-lanceolatis, usque ad 1.4 cm.

longis, obtuse acuminatis, basi acutis, in siccitate brunneis vel pallidis, utrinque nitidis, nervis obsoletis; *floribus* in axillis superioribus fasciculatis, dense confertis, multibracteolatis, 5-meris, circiter 3 mm. longis; calycis glaucescentis longitudinaliter rugosi lobis ovatis, 1 ad 1.2 mm. longis, exterioribus majoribus.

A small glabrous tree 3 to 6 m. high, the branches and branchlets slender, castaneous or reddish-castaneous when dry, the branches terete, bark more or less flaky, the branchlets smooth, distinctly 4-angled, the internodes less than 1 cm. in length. Leaves coriaceous, opposite, ovate to ovate-lanceolate, 7 to 14 mm. long, 4 to 7 mm. wide, smooth, shining, brown or pale when dry, base acute, apex blunt-acuminate, the nerves and reticulations entirely obsolete, eglandular; petioles 1 mm. long or less. Flowers yellowish, crowded in dense fascicles in the upper axils, the fascicles about 5 mm. in diameter. Calyx about 3 mm. long, narrowed below, glaucous, longitudinally rugose, not at all verruculose, the lobes 5, ovate, acute to obtuse, 1 to 1.2 mm. long, the outer ones distinctly larger than the inner. Petals orbicular, about 1 mm. in diameter. Bracteoles subtending the flowers numerous, 1.5 to 2 mm. long, oblong-obovate to subspatulate, obtuse, more or less concave.

SARAWAK, Mount Santubong, *Foxworthy 454*, June 7, 1908, on a forested ridge, altitude about 300 meters, known to the Malays as *mortap*.

A species manifestly belonging in the same group as *Eugenia zeylanica*, Wight, for which Miquel proposed the section name *Leptomyrthus*. It is distinguished from all hitherto described forms of this group by its very small leaves, the nerves and reticulations being entirely obsolete. It is most closely allied to *Eugenia besukiensis*, (Hassk.) Merr., from which it is at once distinguished by its smaller entirely nerveless leaves.

***Eugenia moultonii*, sp. nov. § *Syzygium*.**

Arbor glabra, ramis ramulisque laevibus stramineis, ramis teretibus, ramulis distincte 4-angulatis vel sulcatis; *foliis* oppositis, subcoriaceis, oblongis, usque ad 12 cm. longis, utrinque subaequaliter angustatis acuminatisque, margine revolutis, supra subolivaceis, subtus pallidis, glandulis jam oculo nudo distinctis, nervis primariis utrinque circiter 20, tenuibus, indistinctis, rectis; *inflorescentiis* axillaribus terminalibusque, 1 ad 2 cm. longis, paucifloris, inferioribus plerumque 3-floris, superioribus trichotomis, ramis 3-floris, bracteis bracteolisque prominentibus; *floribus* 4-meris, omnibus sessilibus, 3 ad 4 mm. longis; *calycis* tubo pallido, rugoso, deorsum leviter angustato, dentibus 4 late rotundatis.

A glabrous tree the branches and branchlets mostly straw-colored, the branches terete, the branchlets about 2 mm. in diameter, 4-angled or sulcate, nearly smooth. Leaves opposite, subcoriaceous, oblong, 7 to 12 cm. long, 2.5 to 4 cm. wide, subequally narrowed to the acuminate base and apex, the apex subacute, margins slightly recurved, the upper surface subolivaceous, slightly shining, minutely verruculose, the lower surface pale, the glands scattered, distinctly visible to the naked eye; primary lateral nerves about 20 on each side of the midrib, slender, obscure, scarcely more distinct than are the secondary ones, anastomosing with the equally obscure marginal nerves close to the edge of the leaf; petioles 10 to 12 mm. long. Cymes terminal and in the upper axils, 1 to 2 cm. long, few-flowered, the axillary ones mostly 3-flowered, the terminal ones trichotomous, each branch 3-flowered, the bracts oblong, coriaceous 3 to 4 mm. long, acute, somewhat keeled, the two bracteoles subtending each flower ovate or elliptic-ovate, rounded, somewhat concave, thickly coriaceous, 2 mm. long. Flowers all sessile, 4-merous. Calyx 3 to 4 mm. long, slightly narrowed below, subterete, rugose, pale when dry, 2 to 2.3 mm. in diameter at the throat, the lobes broad, rounded, 0.3 mm. long, 1.2 mm. wide. Petals united into a deciduous calyptra 2.5 mm. in diameter. Style 2 mm. long; stigma hemispheric, 0.6 mm. in diameter.

SARAWAK, Tabwan road and Rock road, *Native collector* 255, 811 (*Bur. Sci.*), May and June, 1911, with the local names *malaban* and *malaban paya*.

A species readily recognizable by its short, few-flowered, axillary and terminal cymes, straw-colored branches and branchlets, and obscurely nerved, distinctly glandular-punctate leaves. It is named in honor of Captain J. C. Moulton, formerly Director of the Sarawak Museum, who supervised the work of our native collector.

***Eugenia havilandii*, sp. nov. § *Syzygium*.**

Arbor glabra, circiter 15 m. alta, ramis ramulisque brunneis laevibus teretibus vel ramulis leviter compressis; *foliis* ellipticis, coriaceis, usque ad 13 cm. longis, utrinque acuminatis, in siccitate nitidis, brunneis vel supra atro-brunneis, densinerviis, subtus haud glandulosus, supra parce impresso-punctatis, nervis primariis utrinque circiter 30, tenuibus, utrinque quam secundariis vix magis distinctioribus; *inflorescentiis* terminalibus, corymbosis, 3 ad 4 cm. longis, e basi ramosis; *floribus* 5-meris, ad apices ramulorum confertis, omnibus sessilibus; *alabastro* obovoideo, circiter 4 mm. longo.

A glabrous tree about 15 m. high, the branches and branchlets smooth, brown, terete, or the latter 1.5 to 2 mm.

in diameter, slightly compressed. Leaves opposite, coriaceous, elliptic, when dry brown on both surfaces, the lower surface eglandular and paler than the upper which is usually dark-brown and sparingly impressed-punctate, 9 to 13 cm. long, 4 to 6.5 cm. wide, subequally narrowed to the acuminate base and apex, the apical acumen distinct, obtuse, the midrib impressed on the upper surface, very prominent on the lower, the lateral nerves slender, indistinct, densely arranged, the primary ones about 30 on each side of the midrib, about equally distinct on both surfaces and but slightly more prominent than are the secondary ones and the reticulations, anastomosing with the faint marginal nerves about 1 mm. from the edge of the leaf; petioles nearly black when dry, somewhat rugose, 5 to 7 mm. long. Panicles corymbose, terminal, 3 to 4 cm. long, branched from the base, the axis and branches somewhat 4-angled, brown, the latter mostly trichotomous, the flowers sessile, crowded at the apices of the ultimate branchlets, 3 to 6 on each branchlet. Buds obovoid, about 4 mm. long, dark brown when dry, the subtending bracteoles brown, ovate, acute to obtuse, 0.5 to 0.8 mm. long. Calyx-tube terete or somewhat angled by compression, narrowed below, the mouth 2.6 to 2.8 mm. in diameter, the limb with 5, short, obtuse, 0.2 mm. long teeth. Petals entirely united into a calyptra 2.6 to 2.8 mm. in diameter. Stamens numerous, the filaments about 5 mm. long.

SARAWAK, Kuching, Rock road, fifth mile, *Native collector 814* (*Bur. Sci.*), July 21, 1911, with the native name *ubah lawang*. I refer here also two sterile specimens, *Sarawak Museum 64, 78*, with the native names *samak ubah* and *ubah hatak*.

The alliance of this species is apparently with *Eugenia inophylla*, Roxb., from which it differs especially in its shorter inflorescences and distinctly smaller flowers. Named in commemoration of Dr. G. D. Haviland, formerly director of the Sarawak Museum.

Eugenia rufo-tomentosa, Gibbs in Journ. Linn. Soc. Bot. **42** (1914) 77.

Jambosa hirta, Korth. in Nederl. Kruidk. Arch. **1** (1847) 200, non *Eugenia hirta*, Berg.

BRITISH NORTH BORNEO, Kiau, Mount Kinabalu, and on Mount Kalawat, *Mrs. Clemens 9973, 11160, s. n.*, November and December, 1915.

This most characteristic endemic species is very similar to the Philippine *Eugenia ciliato-setosa*, Merr., of Northern Luzon, which differs notably from the Bornean species in its glabrous calyces. From the description I can see no reason for distinguishing *Jambosa hirta*, Korth., from *Eugenia rufo-*

tomentosa, Gibbs, Korthals's type being from Mount Sakoembang near Banjoewiran, Borneo: but Korthals's specific name is invalid in *Eugenia*.

Eugenia saligna, (Miq.) C. B. Rob. in Philip. Journ. Sci. 4 (1909) Bot. 392.

Jambosa saligna, Miq., Fl. Ind. Bat 11 (1855) 432.

Eugenia acuminatissima, Kurz in Journ. As. Soc. Beng. 462 (1855.) 67 non Miq., *vec* Berg.

Eugenia cumingiana, Vid. Phan. Cuming. Philip. (1885) 173.

SARAWAK, Samatan, *Foxworthy* 143, May, 1908, locally known as *uba puti*; Baram District, Miri River, *Hose* 533, February, 1895.

Eugenia cumingiana, Vid., a species originally described from Philippine material, has been reported from British North Borneo by Miss Gibbs. A cotype of Vidal's species is before me, and I can detect no differences between it and *Eugenia acuminatissima*, (Blume) Kurz. As the latter name is invalid in *Eugenia*, I have followed Robinson in accepting the name supplied by *Jambosa saligna*, Miq., Miquel's species having been reduced by Koorders and Valetton as a synonym of *Eugenia acuminatissima*, Kurz.

India to southern China through Malaya to tropical Australia.

Eugenia rugosa, (Korth.) comb. nov.

Syzygium rugosum, Korth. in Nederl. Kruidk. Arch. 1 (1848) 204; Walp. Ann. 2 (1851) 630.

Eugenia varians, Miq., Anal. Bot. Ind. 1 (1850) 21, *pro parte*.

SARAWAK, *Native collector* 1775 (*Bur. Sci.*).

The specimen I have identified with Korthals' species, greatly resembles *Eugenia zeylanica*, Wight, but agrees with the short description of *Syzygium rugosum*, Korth., the type of which was from Borneo, and differs notably from *Eugenia zeylanica*, Wight, in the distinctly pitted upper surface of the leaves, and its smooth, not tuberculate calyces, characters indicated by Korthals. I do not consider that Miquel was correct in referring *Syzygium rugosum*, Korth., together with *Myrtus zeylanica*, Linn., *Eugenia spicata*, Lam., and *Syzygium zeylanicum*, DC., to *Eugenia varians*, Miq. Miquel later, Fl. Ind. Bat. 11 (1855) 437, referred *Syzygium rugosum*, Korth. to *Jambosa? bracteata*, Miq., which is apparently a synonym of *Eugenia zeylanica*, (Linn.) Wight.

Eugenia operculata, Roxb., Fl. Ind. ed. 2, 2 (1832) 486.

BRITISH NORTH BORNEO, Mount Kinabalu, Kiau, Mrs. Clemens 10101, November, 1915.

India to southern China southward through the Malay Peninsula to Java.

Eugenia cymosa, Lam., *Encycl.* **3** (1789) 199.

SARAWAK, Mount Merinjak, *Native collector 2602, 2644* (*Bur. Sci.*).

The specimens have somewhat narrower leaves than in the typical form, and are rather prominently but obtusely caudate-acuminate.

India through the Malay Peninsula and Archipelago to the Moluccas.

Eugenia palembanica, (Miq.), *comb. nov.*

Syzygium palembanicum, Miq., *Fl. Ind. Bat. Suppl.* (1862) 313.

Eugenia lepidocarpa, Wall., *Cat.* (1832) no. 3618, *nomen nudum*.

SARAWAK, Retuh, *Native collector 2551* (*Bur. Sci.*), February-June, 1914.

The specimen, which has very young flowers, agrees closely with material from Singapore, but even better with *Van Rossum 5* from Biliton. I have adopted Miquel's specific name as that of Wallich is merely a *nomen nudum*; no description of Wallich's species appears to have been published until 1878.

Burma to Singapore, Sumatra, Billiton and Borneo.

Eugenia densiflora, DC., *Prodr.* **3** (1828) 287, in syn.

Jambosa densiflora, DC. *l.c.*

Myrtus densiflora, Blume, *Bijär.* (1826) 1087.

SARAWAK, Baram District, Mount Skiwa, *Hose 445*, December, 1894.

Malay Peninsula, Sumatra, Borneo and Java.

Eugenia oblata, Roxb., *Fl. Ind. ed. 2*, **2** (1832) 493.

BRITISH NORTH BORNEO, Mount Kinabalu, trail to Marai Parai Spur, *Mrs. Clemens 10974*, December 1, 1915.

The specimen is in fruit, but agrees in all essentials with Indian material representing Roxburgh's species. Chittagong to the Malay Peninsula and Java (if King's reduction of *Jambosa pulchella*, Miq. is correct).

Eugenia clavata, (Korth.), *comb. nov.*

Jambosa clavata, Korth. in *Nederl. Kruidk. Arch.* **1** (1847) 231; *Walp. Ann.* **2** (1851) 638.

Eugenia rhododendrifolia, Miq., in *Anal. Bot. Ind.* **1** (1850) 19, *t. 2*.

SARAWAK, Baram District, Miri River, *Hose* 689, April 21, 1895.

This species is known only from Borneo. *Eugenia rhododendifolia*, Miq., is based on *Jambosa clavata*, Korth., but Korthals's specific name is the valid one for the species.

Eugenia chlorantha, Duthie in Hook. f., Fl. Brit. Ind. 2 (1878) 487.

SARAWAK, Siol, *Native collector* 2436 (*Bur. Sci.*), February-June, 1914, flowers pale red.

The specimen agrees with King's amplified description of this species and with authentically named specimens from Penang, except in having slightly smaller flowers and the calyx-tube less thickened than in the typical form. Widely distributed in the Malay Peninsula and also known from Sumatra.

Eugenia ugoensis, C. B. Rob. in Philip. Journ. Sci. 4 (1909) Bot. 389.

BRITISH NORTH BORNEO, Mount Kinabalu, Marai Parai Spur, *Mrs. Clemens* 10973, December 1, 1915, altitude about 2500 meters.

The specimen agrees entirely with Robinson's type except in its slightly more slender branchlets. Otherwise known only from the higher mountains of the northern Luzon.

Eugenia lineata, (Blume), Duthie in Hook. f., Fl. Brit. Ind. 2 (1878) 487.

SARAWAK, *Hewitt*, April, 1906; *Native collector* 263, 421, 442, 470, 1692, 2006, 2771 (*Bur. Sci.*); Baram, *Hose* 324.

This species is widely distributed in the Malay Peninsula and Archipelago, extending through Sumatra, Borneo, and Java, apparently to the Moluccas.

Eugenia besukiensis, (Hassk.), comb. nov.

Micro jambosa besukiensis, Hassk. ex Miq., Fl. Ind. Bat. Suppl. (1862) 311 in syn.

Jambosa buxifolia, Miq., Fl. Ind. Bat. 11 (1858) 1036, non *Eugenia buxifolia*, Willd.

SARAWAK, Siol, *Sarawak Museum* 70, with the local name *ubah beti*; BRITISH NORTH BORNEO, Sandakan, *Villamil* 114, 1916, rocky places near the seashore, *Mrs. Clemens* 9509, December 21, 1915, on banks near the beach.

This very characteristic species was originally described by Miquel from specimens collected in Bangka, but Miquel's specific name is untenable in *Eugenia*.

Eugenia zeylanica, (Linn.) Wight, Ic. 1 (1840) 73.*Syzygium zeylanicum*, DC., Prodr. 3 (1828) 260.*Eugenia varians*, Miq., in Anal. Bot. Ind. 1 (1850) 21, excl. syn. *Syzygium rugosum*, Korth.

SARAWAK, Native collector 262, 476, 1117, 1453, 1854 (Bur. Sci.).

The specimens agree closely with material from the Malay Peninsula and India as well as with the descriptions of the above species.

India and Ceylon through the Malay Peninsula to Sumatra, Borneo, and Java.

Tristania, R. Brown.**Tristania anomala**, sp. nov.

Arbor glabra, inflorescentiis parce adpresse pubescentibus exceptis; ramis teretibus, ramulis distincte trigonis; foliis alternis, coriaceis, usque ad 2.5 cm. longis, oblongo-obovatis, obtusis, basi cuneatis, nitidis, costa supra impressa, subtus prominente, nervis lateralibus circiter 10, obscuris, interdum subobsoletis vel obsoletis; inflorescentiis terminalibus axillaribusque, pedunculatis, 2 ad 4 cm. longis, partibus junioribus parce pubescentibus; floribus 5-meris, urceolatis, 2 mm. longis; petalis 5, suborbicularis, 0.8 mm. diametro; staminibus 5, oppositipetalis.

A tree, glabrous except the younger parts of the inflorescence. Branches terete, grayish-brown, the bark somewhat wrinkled, the branchlets triangular, reddish-brown. Leaves alternate, coriaceous, oblong-obovate, obtuse, narrowed to the cuneate base, margin slightly recurved, 1.7 to 2.5 cm. long, 8 to 14 mm. wide, the upper surface minutely pitted, pale-olivaceous or brownish when dry, shining, the midrib impressed on the upper surface, rather prominent beneath; lateral nerves about 10 on each side of the midrib, slender, obscure, sometimes obsolete or nearly so, anastomosing with the equally obscure marginal nerves; petioles about 2 mm. long. Cymes terminal and in the upper axils, peduncled, 2 to 4 cm. long, 2 cm. wide or less, the younger parts sparingly appressed-pubescent. Flowers urceolate, 2 mm. long and wide, pedicelled, sparingly appressed-pubescent externally, yellowish. Calyx teeth 5, triangular, acute, 0.3 mm. long. Petals 5, suborbicular, about 0.8 mm. in diameter. Stamens one opposite each petal; filaments glabrous, 0.4 mm. long. Fruit unknown.

SARAWAK, summit of Mount Murud, Native collector 2868 (Bur. Sci.) (Original number 122), December 1, 1914.

This species, like the next, is anomalous in *Tristania* by having but a single stamen opposite each petal, and this character alone might be deemed sufficiently important to warrant describing the present species as a new generic type. However, as the fruits are unknown, and as in all other characters the plant corresponds with *Tristania*, I have so described it. In some species of *Tristania* the reduction of the number of stamens is very marked; I have a specimen of *T. sumatrana*, Miquel, from Billiton in which there are but two or three stamens opposite each petal, while in the Philippine *T. decor-ticata* there are but three stamens opposite each petal, so that it is not surprising to find a plant that is a *Tristania* in all respects, except its stamens, in which the reduction in the number of stamens has gone to the extreme of one stamen for each petal.

***Tristania pentandra*, sp. nov.**

Frutex 2 ad 3 m. altus novellis inflorescentiisque exceptis glaber; *foliis* alternis, oblongis ad oblanceolatis, coriaceis, in siccitate brunneis, nitidis, usque ad 9 cm. longis, utrinque subaequaliter angustatis acuminatisque, haud puncticulatis, nervis utrinque circiter 18, adscendentibus, tenuibus, obscuris; *inflorescentiis* axillaribus, pubescentibus, pedunculatis, circiter 2.5 cm. longis; *floribus* 5-meris, 2 mm. longis, *staminibus* 5; *ovario* 3-loculare.

A shrub 2 to 3 m. high, the younger branchlets and inflorescences brown-pubescent, the very young leaves sparingly pubescent, otherwise glabrous. Branches terete, dark-brown, the branchlets nearly black when dry, irregularly angled or subterete. Leaves crowded, alternate, oblong to oblanceolate, brown and somewhat shining when dry, not glandular-puncticulate, 6 to 9 cm. long, 1.5 to 2.5 cm. wide, subequally narrowed and acuminate at both ends, the apex blunt-acuminate; midrib impressed on the upper surface, prominent beneath, the lateral nerves slender, obscure, ascending, about 18 on each side of the midrib, anastomosing with the slender submarginal veins about 1 mm. from the edge of the leaf. Cymes in the uppermost axils, peduncled, brown-pubescent, about 2.5 cm. long, 1 to 1.5 cm. wide, the flowers rather numerous, crowded, 5-merous, their pedicels 1.5 to 2 mm. long. Calyx pubescent, 2 mm. long and wide, subturbinate or turbinate-urceolate, the teeth triangular, acute, 0.5 mm. long. Petals 5, orbicular-obovate, glabrous, 1 mm. long, rounded. Stamens one opposite each petal, their filaments glabrous, 0.8 mm. long. Ovary pubescent, 3-celled.

SARAWAK, Mount Poe, *Foxworthy* 378, June 3, 1908, near the summit, altitude about 1700 meters, the flowers yellow, fragrant. Known to the Dyaks as *bindang*.

This species strongly resembles the Philippine *Tristania decorticata*, Merr., and has been so reported by Robinson.* However, it is at once distinguishable from the Philippine species by its solitary stamens opposite each petal, a character unknown in the genus *Tristania* except in the present species and in *T. anomala*, Merr. It is readily distinguished from the latter by its much larger, differently shaped leaves.

Tristania clementis, sp. nov.

Arbor parva, glabra ramulis junioribus exceptis inflorescentiisque minute adpresseque cupreo-pubescentibus; foliis subcoriaceis, oblongo-obovatis, nitidis, usque ad 7.5 cm. longis, obtusis ad late obtuseque acuminatis, basi cuneatis, margine leviter recurvatis, subtus distincte puncticulatis, nervis primariis utrinque circiter 15 tenuibus; inflorescentiis axillaribus, pedunculatis, circiter 3 cm. longis, dichotomis; floribus 5-meris, circiter 3 mm. diametro, petalis glabris, orbiculari-obovatis, minute crenulatis; staminibus 25 vel 30 in phalangibus 5- vel 6-andris dispositis; ovario pubescente, 3-loculare.

A small tree, glabrous except the minutely appressed-cupreous-pubescent branchlets and inflorescences. Branches terete, dark reddish-brown or nearly black when dry, the branchlets more or less compressed-angular, reddish-brown. Leaves subcoriaceous, oblong-obovate, 5 to 7.5 cm. long, 1.5 to 3 cm. wide, the upper surface greenish-olivaceous and shining when dry, minutely and obscurely puncticulate, the lower surface pale-brownish, distinctly glandular-punctate, apex obtuse to broadly and shortly blunt-acuminate, base cuneate, margins somewhat recurved; lateral nerves about 15 on each side of the midrib, slender, not prominent, obscurely anastomosing with the marginal nerves about 1 mm. from the edge of the leaf; petioles brown, 5 to 9 mm. long. Cymes in the upper axils, about 3 cm. long, peduncled, dichotomous, minutely appressed-pubescent with cupreous hairs, rather few-flowered. Flowers 5-merous, about 3 mm. long and wide, their pedicels 1.5 to 2 mm. long, somewhat crowded on the ultimate branchlets. Calyx turbinate, slightly pubescent, the teeth 5, very broad, shallow, subacute. Petals glabrous, dull white, orbicular-obovate, rounded, minutely crenulate, 1.2 mm. long. Stamens in five phalanges opposite the petals, 5 or 6 in each group, the filaments 0.5 to 1 mm. long, united and sparingly pubescent below. Ovary sparingly pubescent, 3-celled; style glabrous, 1 mm. long.

BRITISH NORTH BORNEO, Jesselton, Mrs. Clemens 9570, October 23, 1915, on hillsides near dwellings, cultivated, the bark shedding like that of *Eucalyptus*.

* Philip. Journ. Sci. 4 (1909) Bot. 324.

This species differs from *Tristania obovata*, R. Br., in its smaller, narrower, differently shaped, not retuse leaves, in its sparingly pubescent, not glabrous calyces, its more numerous stamens, and its minutely crenulate, not sharply toothed petals. From *T. merquensis*, Griff., it differs in its much smaller flowers and in numerous other characters.

Tetraeugenia, genus novum.

(*Myrtoideae-Myrteae-Eugeniinae*).

Calycis tubus oblongo-obovoideus, deorsum angustatus, supra ovarium leviter productus; limbi segmenta 4, minuta. *Petala* conniventia et in calyptram connata. *Stamina* 4, libra, filamentis brevissimis, calycis limbum haud superantia; antherae parvae, loculis longitudinaliter dehiscentes. *Ovarium* 2-loculare. *Arbor* (vel frutex) glabra. *Folia* opposita, glanduloso-punctata, penninervia, nervis distantibus, prominentibus, arcuato-anastomosantibus. *Flores* minimi axillares terminalesque, fasciculati vel in cymis depauperatis dispositi.

Tetraeugenia caudata, sp. nov.

Arbor (vel frutex) glabra, ramis ramulisque tenuibus, teretibus: *foliis* papyraceis, ovato-ellipticis, in siccitate olivaceis, nitidis, usque ad 11 cm. longis, pellucido-punctatis, basi acutis, apice longe tenuiterque caudato-acuminatis, nervis utrinque 8 ad 10 subtus prominentibus distantibus arcuato-anastomosantibus; *floribus* paucis, minutis, axillaribus terminalibusque, oblongo-obovoideis, 2.3 ad 3 mm. longis, fasciculatis vel in cymis valde depauperatis dispositis; *calyce* minute 4-denticulato.

A glabrous tree or shrub, the branches and branchlets slender, terete, 1 to 1.5 mm. in diameter, the former pale, the latter brown and sometimes slightly flattened at the nodes. Leaves opposite, chartaceous, olivaceous, somewhat shining and of about the same color on both surfaces when dry, ovate-elliptic, 7 to 11 cm. long, 3 to 4.5 cm. wide, base acute or somewhat acuminate, apex slenderly caudate-acuminate, the acumens 1.5 to 2.5 cm. long, blunt, minutely pellucid-punctate, the glands evident on the upper surface, obsolete on the lower surface; lateral nerves 8 to 10 on each side of the midrib, prominent on the lower surface, straight, anastomosing with the somewhat arched and equally prominent marginal nerves 3 to 7 mm. from the edge of the leaf; petioles 1 cm. long or less. Flowers axillary and terminal, few, fascicled or in very depauperate cymes, oblong-obovoid, 2.5 to 3 mm. long, buds rounded, tapering below, the subtending bracteoles ovate-lanceolate, acuminate, about 1 mm. long. Calyx-teeth 4, minute.

Petals united into a deciduous calyptra about 1 mm. in diameter. Stamens 4, not exceeding the calyx-rim in length.

SARAWAK, Baram District, Mount Trekan, *Hose 6*, July, 1895, altitude about 600 meters.

On first studying the above specimen I was disposed to place it in the genus *Aphanomyrtus*, but it differs so radically from all the described species of this genus and of its synonym *Pseudoeugenia*, that it manifestly is worthy of consideration as a distinct generic type. Distinguishing characters are its laxly veined leaves, its four stamens, and its petals being united into a distinct calyptra as in *Syzygium*. It apparently holds about the same relationship to *Syzygium* as *Aphanomyrtus* does to *Jambosa*.

LOGANIACEAE.

Fagraea, Thunberg.

This genus is apparently well developed in Borneo, for a number of species have been described already from the comparatively small Bornean collections available to botanists in the past sixty-five years. The following species have been described from Bornean material: *Fagraea borneensis*, Scheff., *F. coarctata*, Blume (= *F. racemosa*, Jack, fide King), *F. cordifolia*, Blume, *F. crassipes*, Benth (= *F. cuspidata*, Blume, fide Boerlage), *F. cuspidata*, Blume, *F. heterophylla*, Blume, *F. ligustrina*, Blume, *F. macroscyptha*, Baker, *F. minor*, Blume, *F. robusta*, Blume (= *F. racemosa*, Jack, fide King), *F. spicata*, Baker, and *F. splendens*, Blume (= *F. rostrata*, Blume, fide Miquel); also there is *F. stenophylla*, Becc., named, but as yet undescribed. In addition to these a few other species have been credited to Borneo by various authors, including *Fagraea racemosa*, Jack, (*F. morindaefolia*, Blume), and *F. littoralis*, Blume, var. *forstenii*, Miq. From a study of our own Bornean collections, however, it is evident that many forms of this characteristic genus still remain to be described, for these comparatively small collections present no less than fourteen distinct species of the genus. A number of these I have been able to determine as species previously described by other authors, but five are apparently worthy of description as new species.

Fagraea grandifolia, sp. nov.

Species *F. racemosae* affinis, differt foliis majoribus, nervis magis numerosis, utrinque 10 ad 12; foliis ellipticis ad oblongo-ellipticis, coriaceis, pallide brunneis, usque ad 35 cm. longis, apice abrupte brevissime et obtuse acuminatis, basi subrotundatis; inflorescentiis 20 ad 30 cm. longis, longe pedunculatis, cymis oppositis, distantibus, paucifloris, inferioribus pedunculatis, superioribus sessilibus; floribus circiter 2.5 cm. longis, longe pedicellatis.

Branches and branchlets terete, brown, the ultimate ones about 5 mm. in diameter. Leaves coriaceous, pale-brownish on both surfaces when dry, slightly shining, 27 to 35 cm. long, 14 to 17 cm. wide, apex abruptly and shortly obtuse-acuminate, the acumen about 5 mm. long, the base somewhat rounded, elliptic to oblong-elliptic; lateral nerves 10 to 12 on each side of the midrib, prominent on the lower surface, curved, the reticulations obsolete or very lax and indistinct on the upper surface; petioles about 2 cm. long. Inflorescences terminal, including the peduncles 20 to 30 cm. long, the peduncles about as long as the flower-bearing parts, the flowers in distant opposite cymes, the lower cymes peduncled and about 5 cm. long, the upper sessile, all few-flowered. Flowers 5-merous, about 2.5 cm. long, their pedicels 5 to 13 mm. long. Calyx cup-shaped, about 6 mm. long, the lobes broad, rounded. Corolla-tube about 2.2 cm. long, gradually widened upward, the lobes elliptic, rounded, spreading, about 7 mm. long.

SARAWAK, Baram District, Miri River, *Hose 742*, April 20, 1895.

The alliance of this species is manifestly with *Fagraea racemosa*, Jack, from which it is readily distinguished by its larger more numerous nerved leaves, long peduncled, lax inflorescences, the opposite cymes rather widely separated, the lower ones peduncled and the upper ones sessile, few-flowered, the flowers rather long-pedicelled.

***Fagraea acuminatissima*, sp. nov.**

Species *F. obovatae* affinis, ramis ramulisque brunneis, teretibus; *foliis* coriaceis, oblongo-ellipticis, usque ad 20 cm. longis, eveniis, basi acutis, apice tenuiter acute caudato-acuminatis, opacis, in siccitate brunneis vel supra subolivaceis; petiolo 2.5 ad 5 cm. longo; *inflorescentiis* terminalibus, sessilibus vel brevissime pedunculatis, umbellatim 3- ad 5-floris; *floribus* sessilibus, circiter 5 cm. longis; *calycis* lobis ovatis, obtusis, circiter 6 mm. longis; *corollae* tubo circiter 3 cm. longo, sursum ampliato, lobis patulis, oblongis, obtusis, circiter 1.5 cm. longis.

Apparently scandent, entirely glabrous, the branches and branchlets terete, dark-brown, the ultimate ones 4 to 5 mm. in diameter, smooth. Leaves thickly coriaceous, oblong-elliptic, 14 to 20 cm. long, 4.5 to 6 cm. wide, base acute, apex rather abruptly and slenderly caudate-acuminate, the acumen acute, about 2 cm. long, the upper surface brown or somewhat olivaceous, dull, the lower brown, both surfaces minutely verruculose when dry, the midrib very prominent on the lower surface, the nerves and reticulations obsolete; petioles 2.5 to 5 cm. long; stipules broadly triangular-ovate, about 4 mm. long.

Flowers terminal, about 5 cm. long, 5-merous, subumbellately arranged, sessile, 3 to 5 at the apex of each branchlet, the inflorescence sessile or very shortly peduncled, the bracts coriaceous, acuminate, ovate-lanceolate, 4 to 5 mm. long, the two bracteoles subtending each flower similar but much smaller. Calyx 10 to 11 mm. long, the lobes ovate, obtuse, 6 mm. long. Corolla-tube about 3 cm. long, slender below, gradually widened in the upper one-half and about 7 mm. in diameter at the throat; lobes spreading, oblong, obtuse, about 1.5 cm. long; anthers somewhat exserted, about 2 mm. long.

SARAWAK, Matang road, *Native collector 686 (Bur. Sci.)*, June 29, 1911, with the local name *nyatu*. Perhaps referable here is *Hose 46* from the Baram District, April, 1895, of which I have a very fragmentary specimen. In this specimen the leaves are relatively wider, about 14 cm. long and 7 cm. wide, while the flower is slightly longer than in the type, the corolla being 5.5 cm. in length.

The alliance of this species is manifestly with *Fagraea obovata*, Wall., from which it is distinguished by its differently shaped, slenderly and acutely caudate-acuminate leaves. By the latter character it is also distinguished from the Bornean species, *Fagraea heterophylla*, Blume, *F. rostrata*, Blume, and *F. splendens*, Blume.

***Fagraea involucrata*, sp. nov.**

Glabra, ramis ramulisque teretibus; *foliis* oblongis ad oblongo-ellipticis, crasse coriaceis, usque ad 22 cm. longis, in siccitate supra atro-brunneis, subtus brunneis, opacis, apice abrupte et tenuiter acute acuminatis, basi acutis vel decurrento-acuminatis, nervis utrinque circiter 10, supra obscuris, subtus prominentibus; *stipulis* subreniformibus, coriaceis, reflexis, circiter 1.5 cm. latis; *floribus* terminalibus, solitariis, sessilibus, circiter 20 cm. longis, bracteolis 4 elliptico-ovatis acutis vel acuminatis crasse coriaceis circiter 4 cm. longis calycem involucrantibus; *calycis* tubo vix 1 cm. longo, lobis oblongo-ovatis, acuminatis, coriaceis, 6 cm. longis; *corolla* alba, tubo 15 cm. longo, sursum ampliata, lobis patulis vel reflexis, ovatis, 3.5 ad 4 cm. longis; *antheris* exsertis, 1 cm. longis.

Glabrous, the branches and branchlets terete, dark-colored when dry, the ultimate ones 6 to 8 mm. in diameter, smooth. Leaves thickly coriaceous, minutely verruculose on both surfaces when dry, dull, oblong to oblong-elliptic, 14 to 22 cm. long, 5 to 8 cm. wide, the upper surface blackish-brown when dry, the lower brown, apex rather abruptly and slenderly acute-acuminate, the acumen about 1 cm. long, base acute to somewhat decurrent-acuminate, the midrib prominent on both surfaces; lateral nerves about 10 on each side of the midrib, very

obscure on the upper surface, very prominent on the lower surface, dark-brown in contrast to the paler epidermis, spreading, slightly curved, scarcely anastomosing, the reticulations obsolete; petioles 1.5 to 2.5 cm. long; stipules subreniform, coriaceous, reflexed, persistent, about 1.5 cm. wide and 1 cm. long. Flowers terminal, sessile, solitary, white, the calyx subtended and enclosed by an involucre of four, thickly coriaceous, brown (when dry), acute to acuminate bracteoles about 4 cm. long and 2 to 2.5 cm. wide which closely invest the calyx. Calyx 7 cm. long, the tube broad, scarcely 1 cm. in length, the lobes brown when dry, thickly coriaceous, oblong-ovate, acuminate, 6 cm. long, 2.5 to 3 cm. wide, imbricate. Corolla-tube thickly coriaceous, 15 cm. long, dark-brown when dry, when somewhat flattened 8 mm. wide at the base and 3 cm. wide at the apex, the lobes 5, spreading or recurved, coriaceous, ovate, rounded, 3.5 to 4 cm. long. Anthers somewhat exerted, oblong-ellipsoid, 1 cm. long.

SARAWAK, Mount Sudan, *Native collector 2083* (*Bur. Sci.*) February-June, 1914.

This remarkable species is manifestly allied to *Fagraea macroscypha*, Baker, and in fact I first referred it to Baker's species. It differs in its distinctly acuminate, not acute, larger leaves, larger calyx, and corolla, and perhaps in other characters. Baker's description is imperfect in some respects, and he does not indicate the number of bracteoles in his species.

***Fagraea cymosa*, sp. nov.**

Arbor parva, glabra, ramis ramulisque teretibus, glaucopruinosus, vel ramulis junioribus brunneis et leviter compressis; *foliis* late ovatis, vel elliptico-ovatis, crasse coriaceis, usque ad 23 cm. longis, in siccitate brunneis, apice abrupte acuminatis, basi late truncato-rotundatis, nervis utrinque 6 ad 8, prominentibus; *inflorescentiis* terminalibus, cymosis, diffusis, usque ad 11 cm. longis, breviter pedunculatis, dichotomis; *floribus* 2 vel 3 in ramulis ultimis dispositis, longe pedicellatis, circiter 5.5 cm. longis. Species *F. racemosae*, Jack, affinis.

A small glabrous tree, the branches and branchlets terete, glaucous-pruinose, or the younger branchlets brown and somewhat compressed, the ultimate ones 3 to 5 mm. in diameter. Leaves brown when dry, thickly coriaceous, slightly shining, broadly ovate to elliptic-ovate, 17 to 23 cm. long, 11 to 15 cm. wide, apex abruptly acuminate, base broadly rounded-truncate; lateral nerves 6 to 8 on each side of the midrib, prominent, anastomosing, the reticulations lax, indistinct; petioles brown or pruinose, about 1 cm. long. Cymes terminal, diffuse, dichotomous, up to 11 cm. in length, the peduncles 1.5 to 3.5 cm. long, the ultimate branches of the cymes bearing 2 or 3, long-

pedicelled, white, 5-merous flowers, the bracteoles broad, rounded, coriaceous, 2 to 3 mm. long, the pedicels 1.5 to 2.5 cm. long. Calyx about 1 cm. long, brown when dry, base cuneate, the lobes broadly-ovate to suborbicular, rounded, about 5 mm. long. Corolla 5 cm. long, narrowed below, the lobes broadly ovate, rounded, about 1 cm. long; anthers slightly exerted, about 6 mm. long.

BRITISH NORTH BORNEO, Jesselton, Mrs. Clemens 9627, December 14, 1915, on hills near the seashore; "also seen at Kiau." I am disposed to refer here also the following specimens from Sarawak: *Native collector 383, 776 (Bur. Sci.)*, May, 1911, with the native name *sukung*. These two specimens differ from the type in having somewhat smaller flowers, the corolla about 3.5 cm. in length, but in other characters closely approximate it.

The alliance of this species is manifestly with *Fagraea racemosa*, Jack, from which it is distinguished by its much shorter, cymose, rather diffuse inflorescences and long-pedicelled flowers. It differs from the other Bornean species in this group, namely *Fagraea coarctata*, Blume, *F. crassipes*, Benth., *F. cuspidata*, Blume, and *F. robusta*, Blume, in its shortly peduncled inflorescences which are cymose, not racemose in arrangement.

Fagraea uniflora, sp. nov.

Frutex scandens, ramis ramulisque teretibus; *foliis* oblongis, coriaceis, in siccitate atro-brunneis, usque ad 14 cm. longis, basi acutis, apice tenuiter acute acuminatis, nervis utrinque circiter 7, tenuibus, valde obscuris vel subobsoletis; *floribus* solitariis, terminalibus, pallide luteis, breviter pedicellatis, bibracteolatis, circiter 13 cm. longis; *calyce* 3 cm. longo, lobis 6 ovato-ellipticis, circiter 1 cm. longis, coriaceis; *corollae* tubo 8 ad 9 cm. longo, lobis 8 vel 9 oblongis vel leviter oblongo-obovatis, obtusis, coriaceis, circiter 4 cm. longis.

A scandent shrub, apparently epiphytic, glabrous. Branches and branchlets terete, nearly black when dry, the ultimate ones about 4 mm. in diameter. Leaves coriaceous, oblong, 12 to 14 cm. long, 3.8 to 5 cm. wide, the apex rather slenderly acute-acuminate, base acute, margins slightly recurved, the upper surface blackish-brown when dry, slightly shining, the lower paler, both minutely verruculose, the midrib prominent on both surfaces; lateral nerves about 7 on each side of the midrib, very slender, obscure, sometimes obsolete or nearly so; petioles 1.5 to 2 cm. long, black when dry, base somewhat dilated and clasping the stem. Flower pale-yellow, fragrant, when dry dark-brown, terminal, solitary, the pedicel

stout, nearly 1 cm. long, bibracteolate, the bracteoles coriaceous, very broad, rounded, about 3 mm. long. Calyx 5 cm. long, the lobes 6, ovate-elliptic, obtuse, coriaceous, about 1 cm. long. Corolla-tube 8 to 9 cm. long, 5 to 6 mm. in diameter below, somewhat widened upward, the lobes 8 or 9, oblong or somewhat oblong-obovate, coriaceous, obtuse, about 4 cm. long, 1 to 1.3 cm. wide. Anthers linear lanceolate, 1 cm. long, slightly exerted.

SARAWAK, Santubong, *Foxworthy 114*, May 15, 1908, known to the Dyaks as *numpang*.

A very characteristic species on account of its large, solitary, terminal, shortly pedicelled flowers, its six calyx-lobes, and 8 or 9 corolla lobes, these floral characters being anomalous in the genus. It is perhaps as closely allied to *Fagraea monantha*, Miq., as to any other species, but does not conform to Miquel's imperfect description in its terete branches, longer petioles, pedicelled flowers, and 6-merous calyx. Miquel does not describe the corolla of his species.

Fagraea stenophylla, Becc., *Nelle Foreste di Borneo* (1902) 524, fig. 65, 1 (opp. p. 402), *nomen nudum*.

Glabra, ramis ramulisque teretibus, circiter 5 mm. diametro, ramulis in siccitate pallidis; *foliis* anguste lanceolatis, coriaceis, circiter 25 cm. longis et 2 cm. latis, tenuiter acuminatis, basi cuneatis, nervis utrinque circiter 12, obscuris vel interdum obsoletis; *inflorescentiis* terminalibus, racemosis, pedunculatis, paucifloris; *floribus* 5-meris, ad nodos inferiores 3—2, ad superiores 1. Species *F. racemosae* similis.

Fagara stenophylla, Becc., as originally used, is a *nomen nudum*, it being unaccompanied by any word of description, but merely by the citation of *Beccari 3863*, as representing it. The figure cited is a photographic reproduction of a single leaf, from which the species is determinable in connection with other Bornean material representing it. The species is manifestly in the group with *Fagraea racemosa*, Jack, and is well characterized by its very narrow leaves. The short description given above is based on *Native collector 2828* (*Bur. Sci.*) from Selungo, Upper Baram, Sarawak, November 26, 1914.

Fagraea fragrans, Roxb., *Fl. Ind. ed. 2*, 1 (1832) 461.

SARAWAK, *Native collector 685* (*Bur. Sci.*), July, 1911, with the native name *tibuan*: BRITISH NORTH BORNEO, Jesselton, *Mrs. Clemens 9563*, October, 1915, on hillsides, abundant.

Malay Peninsula and Sumatra, Java, (cultivated), through Borneo to Palawan, the Calamianes Islands, and Mindoro in the Philippines.

Fagraea speciosa, Blume, Rumphia **2** (1836) 35, t. 81.

Cyrtophyllum speciosum, Blume, Bijdr. (1826) 1022.

BRITISH NORTH BORNEO, Sandakan, *Villamil 202, 251 bis*, January and November, 1916, with flowers and fruits.

The specimens here referred to Blume's species differ from the typical form in some slight characters, but I believe belong here. Java to the Moluccas.

Fagraea spicata, Baker in Kew Bull. (1896) 25.

BRITISH NORTH BORNEO, Sandakan, *Villamil 293*, January, 1917, in brush-land at low altitudes; *Mrs. Clemens 9453*, October, 1915, with narrower leaves than the typical form.

This endemic species, allied to *Fagraea racemosa*, Jack, is well characterized by its condensed spicate inflorescences.

Fagraea cuspidata, Blume, Mus. Bot. **1** (1850) 170.

SARAWAK, *Native collector 1669, 1812, 1940, 2787* (*Bur. Sci.*); BRITISH NORTH BORNEO, Tenom, *Villamil, 331*, April 8, 1917.

The type of *Fagraea cuspidata*, Blume, was from Borneo, while that of *F. crassipes*, Benth., was from Labuan. Boerlage has reduced Bentham's species to Blume's as a synonym, and after an attentive comparison of the descriptions with each other and with the Bornean specimens cited above, I consider that he is correct. Boerlage also places *Fagraea robusta*, Blume, here, and, with doubt, *F. appendiculata*, Blume. King, however, has referred the first to *F. racemosa*, Jack. Typical *Fagraea racemosa*, Jack, is not represented in our Bornean collections, although it unquestionably occurs in the Island.

APOCYNACEAE.

Alyxia, Banks.

Alyxia pachyphylla, sp. nov.

Frutex scandens, ramulis et foliis junioribus et inflorescentiis plus minusve pubescentibus; ramis teretibus, glabris vel subglabris, ramulis distincte 4-angulatis, scabridis, leviter pubescentibus; foliis 4-natis, crasse coriaceis, ellipticis ad oblongo-ellipticis, usque ad 4.5 cm. longis, apice rotundatis, basi acutis vel subacutis, subolivaceis, nitidis, margine valde recurvatis, nervis utrinque circiter 15 supra obscuris subtus obsolete; cymis axillaribus, pedunculatis, paucifloris, 1 ad 2 cm. longis; floribus circiter 8 mm. longis; corolla extus glabra; ovario dense pubescente.

A scandent shrub, the younger parts and inflorescences more or less pubescent. Branches terete, reddish-brown, smooth or scabrid, about 3 mm. in diameter, the branchlets prominently 4-angled, scabrid and pubescent with short spreading hairs, the internodes 2 to 7 cm. long. Leaves in whorls of fours, elliptic to oblong-elliptic, very thickly coriaceous, 3 to 4.5 cm. long, 1.2 to 2 cm. wide, apex rounded, base acute or subacute, the margins very strongly recurved, the very young ones pubescent on both surfaces with scattered, short spreading hairs, the older ones entirely glabrous, upper surface olivaceous, shining, the lower paler, the midrib here very prominent, the nerves and reticulations obsolete, the upper surface with about 15 pairs of faint nerves spreading at an angle of 90°, slightly impressed; petioles 3 to 5 mm. long. Cymes axillary, peduncled, few-flowered, cinereous-pubescent, their peduncles 5 to 10 mm. long. Flowers white, 3 to 5 on each peduncle, the bracts oblong-ovate to ovate, subobtusate, 1.5 mm. long, the bracteoles similar, smaller, sparingly pubescent. Calyx 2 mm. long, the lobes 5, ovate, obtuse, pubescent, 1 mm. long. Corolla-tube about 6 mm. long, glabrous externally, pubescent within, the lobes broadly ovate, spreading, obtuse, 2 mm. long. Anthers 1 mm. long. Ovary densely pubescent; style glabrous, 3 mm. long.

SARAWAK, Mount Santubong, *Native collector 2224* (*Bur. Sci.*), February-June, 1914.

A very strongly characterized species apparently most closely allied to *Alyxia oleifolia*, King & Gamble, of the Malay Peninsula, differing, however, in its smaller leaves which are rounded at the apex, pubescent cymes, broad calyx lobes, and other characters.

Alyxia odorata, Wall., Cat. (1829) No. 1606; King & Gamble in Journ. As. Soc. Beng. 74² (1907) 418.

SARAWAK, Matang Road, *Native collector 857* (*Bur. Sci.*), August 11, 1911, with the native name *patuk manuk*.

The identification has been made from the description given by King and Gamble; the Bornean specimen, cited above, differs in having the leaves distinctly acuminate. Tenasserim to Malacca and Singapore.

RUBIACEAE.

Timonius, de Candolle.

In 1909 Dr. Th. Valeton* published a consideration of the Malayan species of *Timonius* in which he recognized thirty-three

* Valeton, Th. Beitrage zur Kenntniss der Gattung *Timonius*. *Bull. Dépt. Agr. Ind. Neerl.* 26 (1909) 1-61.

species, of which nine were credited to Borneo. In our own collections of Bornean plants no less than thirteen distinct species are represented, some of the specimens manifestly pertaining to forms described by Valetton, others representing characteristic and strongly marked species that I cannot refer to any known forms of the genus. In 1909 but about six species of the genus were known from the Philippines, but the Philippine list to-day approximates twenty distinct forms, and current collections indicate that the list will be considerably increased as botanical exploration of the Archipelago progresses. It is not surprising, then, that a number of undescribed forms should be found in our comparatively small collections of Bornean plants, and it is confidently expected that a continued botanical exploration of Borneo will yield many other species of this characteristic genus.

Timonius hosei, sp. nov.

Arbor, ramulis et inflorescentiis et foliis pubescentibus; *foliis* oppositis, oblanceolatis ad oblongo oblanceolatis, petiolatis, usque ad 20 cm. longis, chartaceis ad subcoriaceis, apice breviter acute acuminatis, basi gradatim angustatis, cuneatis, in siccitate pallidis, utrinque praesertim ad costam nervosque breviter pubescentibus; nervis utrinque 14 ad 16, prominentibus, venis subparallelis; stipulis ovato-lanceolatis, circiter 1.8 cm. longis, acuminatis, extus pubescentibus, intus dense pallide adpresse-hirsutis; *inflorescentiis* ♂ axillaribus, confertis, brevissime pedunculatis, plerumque trichotomis; *floribus* 5-meris circiter 1.5 mm. longis.

A tree, the branches terete, pale, glabrous, the branchlets rather densely ferruginous-pubescent with short hairs. Leaves opposite, chartaceous to subcoriaceous, oblanceolate to oblong-oblanceolate, 16 to 20 cm. long, 5 to 8 cm. wide, the apex shortly and acutely acuminate, gradually narrowed in the lower one-half or two-thirds to the cuneate base, pale when dry, slightly shining, of about the same color on both surfaces, the upper surface densely brown-pubescent on the midrib and lateral nerves with short hairs and with scattered ones on the epidermis, the lower surface rather uniformly pubescent on the midrib, nerves, and reticulations with similar but pale-brownish hairs; lateral nerves 14 to 16 on each side of the midrib, prominent, slightly curved, anastomosing, the primary reticulations distinct on the lower surface, parallel or subparallel; petioles densely pubescent, 1 to 1.4 cm. long; stipules ovate-lanceolate, acuminate, about 1.8 cm. long, externally pubescent, internally densely appressed-hirsute with pale hairs. Staminate inflorescences axillary, dense, including the flowers 3 cm. long or less, rather uniformly and densely pubescent with pale yellowish-brown hairs, sessile or very shortly peduncled, usually trichotomous, the branches dichotomous or tricho-

tomous; bracts broadly ovate, acuminate, pubescent, 5 to 6 mm. long, the bracteoles similar but smaller. Flowers 5-merous, densely crowded, sessile or shortly pedicelled, often in groups of threes. Calyx cylindric, 6 to 8 mm. long, about 4 mm. in diameter, densely pubescent externally, glabrous within, the teeth 5, ovate, acuminate, less than 1 mm. long. Corolla-tube about 12 mm. long, densely pubescent, the lobes 5, oblong, obtuse, 6 mm. long and 3 mm. wide. Anthers linear, 4 mm. long.

SARAWAK, Baram District, Miri, *Hose 660*, April, 1895.

The distinct primary reticulations of the leaves are parallel or nearly so, but the species does not otherwise appear to be closely allied to any of those separated by Valetton under this character. It is well distinguished by its vegetative characters, its indumentum, and its dense inflorescences.

Timonius villamilii, sp. nov.

Arbor 5 ad 9 m. alta, inflorescentiis ferrugineo-pubescentibus exceptis glabra vel subglabra; *foliis* oblongo-obovatis, usque ad 22 cm. longis, in siccitate brunneis vel olivaceo-brunneis, nitidis, apice brevissime acute acuminatis, in dimidio inferiore gradatim angustatis, basi acutis vel subobtusis, sessilibus vel brevissime petiolatis, nervis utrinque circiter 10 prominentibus, venis laxe reticulatis; *floribus* ♀ axillaribus, solitariis, breviter pedicellatis, circiter 2 cm. longis, 6-meris; *fructibus* ovoideis vel ellipsoideis, circiter 2 cm. longis, plus minusve pubescentibus, pyrenis numerosis, omnibus verticalibus.

A tree 5 to 9 m. high, nearly glabrous except the distinctly ferruginous-pubescent inflorescences and fruits. Branches brownish, the ultimate ones about 5 mm. in diameter, the stipular-scars ferruginous-pubescent. Leaves crowded toward the apices of the branchlets, oblong-obovate, 18 to 22 cm. long, 8 to 10 cm. wide, sessile or subsessile, brownish or brownish-olivaceous when dry, the upper surface shining, the lower paler the younger ones very sparingly pubescent along the midrib, chartaceous to subcoriaceous, the apex very shortly and acutely acuminate or merely acute, narrowed in the lower one-half to the acute or subobtuse base, the basal part 5 mm. wide or less; lateral nerves about 10 on each side of the midrib, prominent, ascending, slightly curved and obscurely anastomosing, the reticulations rather lax, netted, not very prominent; stipules lanceolate, slightly pubescent, acuminate, about 1.5 cm. long. Pistillate flowers axillary, solitary, 6-merous, about 2 mm. long, the pedicels solitary, stout, pubescent, about 5 mm. long, in fruit up to 1 cm. in length. Calyx ovoid or ellipsoid, terete, externally densely ferruginous-pubescent with appressed hairs,

the tube produced 4 mm., obscurely and broadly 6-toothed. cylindric. Corolla-tube 10 mm. long, externally densely appressed pale-pubescent, the lobes 6, oblong, subobtuse. 7 mm. long, somewhat spreading in anthesis, very much thickened and keeled inside. Anthers 3 mm. long. Ovary 6-celled. Fruit (immature) ovoid or ellipsoid, 2 cm. long, appressed-pubescent, not at all sulcate, the pyrenes 30 to 40, all vertical. Bracteoles subtending the flowers and fruits two, linear-lanceolate, pubescent, about 5 mm. long.

BRITISH NORTH BORNEO. Sandakan, *Villamil 129, 252 bis* (type), February 2 and November 25, 1916, in open places and brush-lands, altitude 80 to 110 meters, flowers white. fruits green.

A species well characterized by its rather large, sessile or subsessile leaves which are gradually narrowed to the slender base, and its solitary, short-pedicelled, rather large, 6-merous flowers. It apparently belongs in the group with *Timonius subsessilis*, Val., but is not closely allied to this species or the others placed near it by Valeton, but seems to be closely allied to *Timonius palawanensis*, Elm., which was described from staminate specimens.

Timonius involucratus, sp. nov.

Arbor, floribus fructibusque exceptis glabra; *ramis* ramulisque teretibus; *foliis* coriaceis, ellipticis ad oblongo-ellipticis, utrinque subaequaliter angustatis breviter obtuse acuminatis, usque ad 18 cm. longis, petiolatis, nervis utrinque 6 ad 8 prominentibus, venis reticulatis, supra impressis, subtus valde obscuris; stipulis late obovatis, rotundatis, 2.5 cm. longis, imbricatis; *fructibus* solitariis, brevissime pedicellatis, axillaribus, depresso-globosis, junioribus 1.5 cm. diametro, extus adpresse pubescentibus, pyrenis verticalibus, circiter 18, sepalis persistentibus, inaequalibus, late ovatis, 7 ad 10 mm. longis; *bracteolis* late ovatis, 2.5 ad 3 cm. longis, integris vel trilobatis, in siccitate subcoriaceis, brunneis, obtusis, fructibus involucrentibus.

A glabrous tree except the flowers and fruits. Branches terete, reddish-brown, the ultimate ones about 3 mm. in diameter, striate. Leaves coriaceous, elliptic to oblong-elliptic, brown and slightly shining on both surfaces when dry, 10 to 18 cm. long, 5 to 10 cm. wide, subequally narrowed to the decurrent-acuminate base and the shortly blunt-acuminate apex; lateral nerves 6 to 8 on each side of the midrib, impressed above, prominent beneath, curved, anastomosing, the reticulations netted, impressed on the upper surface, rather close, very obscure on the lower surface; petioles stout, 1 to 1.5 cm. long; stipules brown when dry, subcoriaceous, broadly obovate, im-

bricate, 2 to 2.5 cm. long, nearly as wide, pubescent on the median portion inside, otherwise glabrous. Fruits solitary, depressed-globose, immature ones 1.5 cm. in diameter, the pericarp thick, corky, brittle, dark-brown inside, externally appressed-pubescent with somewhat ferruginous short hairs, the pyrenes about 18, all vertical; calyx-lobes persistent, brown when dry, broadly ovate obtuse, irregular, two larger ones about 10 mm. long, the three smaller ones 7 mm. long; pedicels pubescent, 2 to 3 mm. long; bracteoles persistent, forming an involucre surrounding and including the fruit, broadly ovate, 2.5 to 3 cm. long, about 2.5 cm. wide, obtuse, brown when dry, entire or distinctly 3-lobed, glabrous except at the base inside, subcoriaceous.

SARAWAK, *Native collector 1252 (Bur. Sci.)*.

A remarkable species apparently not closely allied to any previously described form. It is well characterized by its nearly sessile, axillary, solitary fruits, the prominent, irregular, broadly ovate, persistent calyx lobes, the very large bracteoles forming an involucre about the fruits; and the large stipules.

Timonius hirsutus, sp. nov.

Frutex vel arbor; *foliis* oppositis, chartaceis ad subcoriaceis, ovato-ellipticis ad obovato-ellipticis, usque ad 25 cm. longis, utrinque plus minusve hirsutis, supra castaneis, subtus brunneis, apice breviter acute acuminatis, basi decurrento-acuminatis, nervis utrinque 9 to 11 prominentibus, venis reticulatis; stipulis oblongo-lanceolatis, hirsutis, acuminatis, 2 cm. longis; *floribus* ♂ axillaribus, dense confertis, circiter 1.5 cm. longis, 5-meris; *calycis* lobis 5, oblongis, obtusis, circiter 6 mm. longis, utrinque hirsutis.

A shrub or tree, the branchlets, petioles, leaves on both surfaces, and the dense inflorescences more or less fulvous or ferruginous-hirsute. Branches pale, nearly glabrous, the branchlets dark-brown or castaneous, fulvous-hirsute with spreading, scattered, short hairs. Leaves opposite, chartaceous to subcoriaceous, ovate-elliptic to obovate-elliptic, 20 to 25 cm. long, 11 to 13 cm. wide, the apex shortly acute-acuminate, base narrowed, decurrent-acuminate, the upper surface castaneous, shining, the midrib and nerves rather densely fulvous-hirsute, the surface with scattered similar hairs, the lower surface brown or pale-brownish, subferruginous-pubescent on the midrib, nerves, and reticulations; lateral nerves 9 to 11 on each side of the midrib, prominent, curved, anastomosing, the reticulations distinct, netted, the primary ones lax, subparallel; petioles rather densely fulvous-hirsute, 1.5 to 3 cm. long; stipules oblong-lanceolate, coriaceous, acuminate, about 2 cm. long, 8 mm. wide below, dorsally rather densely fulvous-hirsute, inside pale-pubescent. Inflorescences axillary, the flowers densely crowded in con-

gested cymes, the peduncles scarcely 3 mm. long, all parts more or less ferruginous-hirsute. Staminate flowers sessile, about 1.5 cm. long. Calyx tube 5 mm. long, ovoid, externally densely fulvous-hirsute, dark-brown, inside densely pubescent with paler, shining hairs, the lobes 5, oblong, obtuse, 6 to 7 mm. long. Corolla-tube 1 cm. long, externally densely pale-pubescent, the lobes 5, spreading, oblong-ovate, obtuse, 4 to 5 mm. long. Bracteoles lanceolate, acuminate, pubescent on both surfaces, 9 to 11 mm. long.

SARAWAK, Baram District, Miri, *Hose 651*, April 20, 1895.

A most characteristic species, recognizable by its indumentum, its rather large leaves which are castaneous above and pale-brownish beneath, and especially by its very densely crowded flowers. It does not appear to be very closely allied to any previously described species.

Timonius heterophyllus, sp. nov.

Arbor parva, partibus junioribus inflorescentiisque ferrugineo-pubescentibus, ramis teretibus glabris, ramulis distincte 3-angulatis; *foliis* oppositis, superioribus ternatis, oblongo-ovatis, acute acuminatis, basi angustatis, rotundatis vel leviter cordatis, subsessilibus, usque ad 17 cm. longis, nitidis, subtus leviter pubescentibus, nervis utrinque 8 to 10, prominentibus; venis reticulatis; stipulis lanceolatis, tenuiter acuminatis, pubescentibus, circiter 12 mm. longis; *inflorescentiis* ♂ axillaribus, pedunculatis, dichotomis, ramis spicatum unilateraliter 3- ad 6-floris; *floribus* 5-meris, junioribus circiter 12 mm. longis.

A small tree, the branches pale, glabrous, terete, the branchlets about 3 mm. in diameter, glabrous, distinctly 3-angled. Lower leaves opposite, the upper ones ternate, chartaceous, oblong-obovate, 11 to 17 cm. long, 4 to 7 cm. wide, subsessile, the apex shortly acute-acuminate, narrowed below to the rounded or somewhat cordate base which is 1.2 to 1.5 cm. wide, the upper surface dark-brown when dry, shining, glabrous, the lower pale-brown, appressed ferruginous-pubescent on the midrib and nerves and with short scattered pale hairs on the epidermis; lateral nerves 8 to 10 on each side of the midrib, prominent, somewhat curved, anastomosing, the reticulations netted, slender, indistinct; petioles pubescent, 1.5 mm. long or less; stipules lanceolate, slenderly acuminate, 12 mm. long, dark-brown when dry, slightly pubescent, coriaceous. Staminate inflorescences axillary, peduncled, the rachis and branches rather densely fulvous-pubescent, the former up to 2.5 cm. long, the branches two, spiciform, up to 2 cm. in length, spreading, bearing 3 to 6 sessile unilaterally arranged flowers, the bracteoles densely pubescent, oblong to oblong-lanceolate, obtuse to acuminate, 2 to 4 mm. long. Calyx cup-

shaped, about 7 mm. long, dark-brown when dry, densely fulvous-pubescent at the base, otherwise sparingly pubescent externally, inside rather densely pale-pubescent, with 5 short, obscure teeth, eventually irregularly 2- or 3-lobed. Corolla (buds) 12 mm. long, externally densely appressed pale-pubescent, the lobes 5, oblong, obtuse, thickened and keeled inside. Anthers 5, linear, 4.5 to 5 mm. long.

BRITISH NORTH BORNEO, Khota Balud to Kibaya, trail to Mount Kinabalu, *Mrs. Clemens 9811*, October 28, 1915.

A species well characterized by its sessile or subsessile opposite and ternate leaves. I know of no other species of the genus that has ternate leaves except the very different Philippine *Timonius ternifolius*, (Bartl.) F.-Vill. It apparently belongs in the same group as *Timonius anodon*, Miq.

Timonrus clementis, sp. nov.

Arbor parva, glaberrima; *foliis* coriaceis, oblongo-obovatis, usque ad 17 cm. longis, apice breviter acute acuminatis, deorsum angustatis, basi cuneatis, nervis utrinque circiter 10, adscendentibus, curvatis, prominentibus, venis reticulatis utrinque valde obscuris; stipulis lanceolatis, acuminatis, 2.5 cm. longis; *fructibus* axillaribus, solitariis, pedunculatis, ovoideis, circiter 1.4 cm. longis, glabris calycis tubo lobisque intus pubescentibus exceptis; *pyrenis* circiter 18, omnibus verticalibus.

A small tree, entirely glabrous except the persistent calyx-tube and lobes (flowers not seen). Branches pale-brownish, terete or obscurely 4-angled, the internodes 5 to 10 mm. long, the petiolar scars prominent, the ultimate branchlets 4 to 5 mm. in diameter, the growing parts smooth, reddish-brown. Leaves oblong-obovate; coriaceous, brown and shining when dry, the lower surface paler than the upper, 14 to 17 cm. long, 6 to 7 cm. wide, apex shortly acute-acuminate, narrowed from about the middle to the cuneate base; lateral nerves about 10 on each side of the midrib, somewhat ascending, prominent, anastomosing, the reticulations very obscure on both surfaces, netted, sometimes nearly obsolete; petioles dark reddish-brown to nearly black when dry, 1 to 1.5 cm. long; stipules lanceolate, glabrous, slenderly acuminate, 2.5 cm. long, dark-brown when dry. Fruits axillary, solitary, their pedicels 1 cm. in length, the bracteoles lanceolate, acuminate, 4 to 5 mm. long. Fruits ovoid, about 1.4 cm. long, dark-brown or nearly black when dry, terete, glabrous except the inside of the short calyx-tube and lobes which are here appressed-pubescent, the tube about 1 mm. long, 2.5 mm. in diameter, the lobes 4, oblong-ovate, acute or acuminate, about 3 mm. long. Pyrenes about 18, all vertical.

BRITISH NORTH BORNEO, Mount Kinabalu, Marai Parai Spur, *Mrs. Clemens 11078*, December 2, 1915, on a forested ridge, altitude about 2000 meters, the fruits green.

The alliance of this species is clearly with *Timonius koordersii*, Valetou, of Celebes, from which it differs in numerous characters, notably its lanceolate, slenderly acuminate, much longer stipules, thicker, somewhat smaller leaves, shorter pedicels, and fewer pyrenes.

COMPOSITAE.

Lactuca, Linnaeus.

Lactuca retrorsidens, sp. nov.

Herba nana, glabra, 6 ad 10 cm. alta, *foliis* omnibus radicalibus, longe petiolatis, oblongo-obovatis, 1 ad 3 cm. longis, apice rotundatis apiculatisque, deorsum angustatis, basi cuneatis, margine dentibus minutis sparsis retrorsis vel patulis instructis; *capitulis* solitariis, circiter 7.5 mm. longis, circiter 10-floris, longe graciliterque stipitatis, squamis exterioribus numerosis oblongis ad oblongo-ovatis 1.5 ad 3 mm. longis, interioribus circiter 8 anguste oblongis 6 mm. longis obtusis apice minute ciliatis.

A dwarfed, glabrous, perennial herb 6 to 10 cm. high, the roots thickened, the very short caudex 1 cm. long or less, including the persistent bases of the petioles about 5 mm. in diameter. Leaves all radical, long-petioled, the blades greenish-olivaceous when dry, obovate to oblong-obovate, submembranaceous to chartaceous, 1 to 3 cm. long, 5 to 10 mm. wide, apex rounded and apiculate, gradually narrowed below, the base cuneate to decurrent-acuminate; lateral nerves few, very slender, obscure; petioles 1.5 to 6 cm. long, the margins on each side with from two to five short, slender, acute, retrorse or spreading teeth 1 mm. long or less. Heads solitary, about 7.5 mm. long, the scapes slender, 5 to 8 cm. long. Outer bracts oblong to oblong-ovate, obtuse, glabrous, 1.5 to 2 mm. long, succeeded by several oblong, 3 mm. long bracts, the innermost involucre bracts about 8; narrowly oblong, about 6 mm. long and 1 mm. wide, the obtuse apices obscurely ciliate. Flowers about 10 in each head, yellow. Achenes 1.2 mm. long, somewhat compressed, glabrous, slightly narrowed at the apex, scarcely beaked, the pappus brownish, copious, about 4 mm. long.

BRITISH NORTH BORNEO, Mount Kinabalu, Low's Peak, *Mrs. Clemens 10623*, November 13, 1915, in rock crannies above the summit lakelet, the roots with milky juice.

A very characteristic dwarfed species, readily distinguishable by its solitary heads; its long-petioled, obovate to oblong-

obovate leaves; and the few, characteristic, retrorse or spreading, minute marginal teeth on the leaves.

***Lagenophora*, Cassini.**

***Lagenophora gibbsiae*, sp. nov.**

Foliis oblanceolatis vel lineari-oblanceolatis, integris, numerosis, 1.5 ad 2 cm. longis, obtusis vel subacutis, glabris, nervis lateralibus obsoletis; *capitulis* circiter 8 mm. diametro, pedunculis 4 ad 11 cm. longis, sursum leviter pubescentibus foliis 3 ad 5 plus minusve reductis instructis; *achenis* 2.5 mm. longis, oblongo-obovatis, compressis, sursum obscurissime papillatis.

A tufted, nearly glabrous, perennial plant, the roots apparently not thickened as in *Lagenophora billardieri*, Cass. Leaves numerous, rosulate, oblanceolate to linear-oblanceolate, 1.5 to 2 cm. long, 2 to 3 mm. wide, chartaceous or subcoriaceous, olivaceous and shining when dry, glabrous, entire, the apex acute to obtuse, narrowed below, scarcely petiolate, the midrib evident on both surfaces but the lateral nerves and reticulations obsolete. Scapes 4 to 11 cm. tall, each bearing a single head, sparingly pubescent above, each bearing from 3 to 5 more or less reduced, scattered leaves, the uppermost ones 5 to 7 mm. long. Heads about 8 mm. in diameter. Involucral bracts numerous, in general oblong, 3 to 4 mm. long, 1.5 to 1.7 mm. wide, rounded, glabrous except the slightly ciliate apices, when fresh dull-red. Ray flowers white, tinged with pink, the corolla-tube 0.5 mm. long, the limb about 2 mm. long, somewhat navicular, entire, fertile, the achenes compressed, 1.5 to 1.8 mm. long, slightly papillate near the apex, otherwise glabrous. Disk-flowers numerous, yellow, the achenes similar to those of the ray-flowers. Corolla 2 to 2.5 mm. long, the tube short, the limb somewhat campanulate, 4-cleft. Anthers 0.5 mm. long. Style-arms less than 0.5 mm. long. Mature achenes brown, compressed, oblong-obovate, 2.5 mm. long, 1.3 to 1.5 mm. wide, glabrous except in the apical parts where they are obscurely papillate.

BRITISH NORTH BORNEO, Mount Kinabalu, above Paka Cave, *Mrs. Clemens 10560*, November 13, 1915, altitude about 3300 meters, associated with *Centrolepis* and *Potentilla*.

This species, dedicated to Miss L. S. Gibbs, is doubtless the one represented by her *No. 4202*, reported by S. Moore* as a Composite with the habit of *Lagenophora*, but with the flowering heads not sufficiently advanced to allow a certain generic identification of the specimen. *Mrs. Clemens's* speci-

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mens present some heads in full anthesis and others with mature achenes, from an examination of which it is very evident that the plant belongs in the genus *Lagenophora*. The species is apparently most closely allied to the only other one known from the Malayan region, namely *Lagenophora billardieri*, Cass., from which it is readily distinguishable by its much narrower, differently shaped, entire, glabrous leaves, its somewhat leafy scapes, and its differently shaped achenes.

